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Front Cover
Ron Jenkins has painted Montana's most widely distributed upland game bird in flight. Hungarian partridge are likely to chatter raucously when flushed, disrupting the nervous systems of even the most experienced bird hunters.

Inside Front Cover
Across much of Montana, habitat losses have reduced the winter, nesting, and protective cover for pheasants. Habitat restoration programs—like an ongoing effort in western Montana's Bitterroot Valley—may be necessary to ensure pheasant hunting as a Montana tradition, depicted here by Charles J. Fritz.

Back Cover
Dave Maloney's autumn watercolor reflects many of the best things the season has to offer. Glorious color, a rural setting—and perhaps the opportunity to hunt. A reminder: *Always* seek the landowner's permission to hunt.

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PHEASANTS FOR THE FUTURE

The Bitterroot Pheasant Restoration Project includes members of the Ravalli County Fish and Wildlife Association, area landowners, 4-H club members and others interested in improving pheasant habitat—and pheasant populations—in the Bitterroot.

by Bill Thomas

DFWP photo: Dave Books

MANY WESTERN Montana pheasant hunters have become unhappy with their sport over the last few years. Their conclusion: The long-term solution to poor pheasant hunting is *not* to dump pen-raised birds on a put-and-take basis. For many of these hunters knowing what *didn't* work wasn't enough. They've taken the next step: They are finding out what *does* work.

In the Bitterroot Valley near Missoula, part of the reason for the recent increase in the ringneck population has been an energetic campaign by sportsmen to channel the effort and interest in pheasants back to the basics. Rather than the old philosophy of stocking pen-raised roosters strictly for the hunter, working with valley landowners on habitat enhancement is beginning to catch on. Wildlife professionals have been preaching the habitat approach for years, but until sportsmen and landowners came to realize for themselves the futility of endless artificial stocking, the idea had little hope of taking hold.

For those who have converted to the habitat improvement idea, the work has just begun. It's easy to talk about, but it's a difficult, long-term job to do anything about improving habitat for pheasants. The past practice of releasing pen-raised birds had an immediate, visible result that, for most people, ended right there. But if you asked questions like, "Where do these birds go?" "What's it costing us?" or "Isn't there a better way?" you concluded "There *must* be a better way to improve pheasant habitat conditions—and pheasant populations!"

So it has gone with many pheasant hunters in the Bitterroot, for the old-timers as well as for many hunters newer to the valley. After all, pheasants and pheasant hunting have been a way of life in the Bitterroot since the ringneck was first introduced in Ravalli County around the turn of the century. Most of the birds for these early introductions in Montana came from commercial breeders in Washington, Utah, and Oregon. By 1926, pheasants were abundant, and the Fish and Game Commission received a petition from Ravalli County sportsmen requesting an open season. That request was denied, but only because the commission had no legal authority to open a pheasant season. Following legislative action authorizing the commission to set a hunting season for pheasants in 1928, a two-day season was set for Nov. 24-25, with a daily and possession limit of three cocks.

In the next 12 years, the pheasant would become Montana's most popular game bird. Populations statewide, as well as in Ravalli County, peaked between 1940 and 1943.

photo: Jon Cates

Hunters took advantage of this bounty and, in some areas of the state, the 1943 daily limit allowed seven pheasants, and two of those could be hens. But nature's cycle of fluctuation brought populations to an all-time low in 1945. The decline resulted in a statewide closed season in 1946; hunting was reopened in 1948, and has remained open since.

But the recent trend in western Montana has been nothing to crow about. The drastic decline in pheasant numbers in west central Montana is indicative of the trend in the Bitterroot. In 1981, the estimated harvest for west central Montana had dropped to 2,246, down from the recent high of 8,984 in 1963. The statewide pattern is similar, except the decline has not been so dramatic. What are the reasons? Common responses never fail to include predators, hunting pressure, weather, etc. These may account for some of the short-term fluctuations, but they don't seem to explain the overall, long-term decline in pheasant numbers.

"The pheasant rides the farmer's coattails," as R.A. MacMullan so aptly put it. Yet most people who had the opportunity to enjoy the tremendous pheasant populations of the early 1940s or the early '60s find it hard to correlate recent declines with habitat changes. Changes in the habitat over the years can be hard to spot and difficult to assess over a general, widespread area. Certainly, we notice a change here or there, but the total picture often eludes us. Although we're not as aware of what's happened to the habitat as we are to the pheasant population, changes are often as great or greater to the habitat.

Changes in land uses in the Bitterroot Valley seem to parallel those of other areas in western Montana. In the Bitterroot, the acreage of small grain crops has decreased significantly, alfalfa acreage has almost doubled, and cattle numbers have increased by 136% between 1950 and 1970. With the current emphasis on beef production, many pastures, abandoned orchards, stream courses, and woody cover areas are intensively grazed. Along with conversion of some of the valley's prime pheasant range to housing developments, this habitat loss has reduced the winter, nesting, and protective cover for pheasants. Although each of these changes occurred one at a time, the cumulative effect has been devastating. What once was some of the state's best pheasant range has been relegated to a mere fraction of its former ability to produce thriving pheasant populations.

Some Bitterrooters recently realized if they were to *really* help the pheasant population in the valley, they needed to work to reverse the trend of pheasant habitat loss. A group of sportsmen calling itself the Bitterroot Pheasant Restoration Committee from the Ravalli County Fish and Wildlife Association (RCFWA), along with landowners and government agency personnel, was organized under the leadership of Nick Kramis. Kramis has seen pheasants and pheasant hunting come and go in the Bitterroot Valley in his 72 years and he, too, rode the pheasant-stocking philosophy for a number of years. As he puts it, "We had our eggs in the wrong basket. Raising pheasants for the hunter's gun and dumping them in the valley wasted time and dollars we could have been putting into habitat."

In 1979, Kramis and other members of the RCFWA met with Department of Fish, Wildlife and Parks personnel to discuss the past, present, and future of the ringneck in the valley. A big change had occurred—instead of the wildlife professional going to sportsmen with the idea of habitat improvement, sportsmen were coming to the department with the idea. The department provided an in-depth review of what other states had attempted in revitalizing their pheasant populations. To gain the benefit of their agricultural perspectives and experience, sympathetic landowners were included from the beginning.

After several meetings in which various information and approaches to the habitat issues were reviewed and discussed, a plan emerged. The committee "went public" with its plans in early spring of 1980 through various media efforts. "If you are a landowner or rural resident in the valley interested in helping establish a population of Chinese ringneck pheasants in your area, there now exists the means and assistance to do so...." read the lead line in the first of a series of articles in the Ravalli Republic, Hamilton's daily newspaper. The article went on to outline the types of assistance available and whom to contact.

News of the program spread from neighbor to neighbor as interest and participation grew. The phones started ringing, and the inquiries seemed promising. Committee members responding to these inquiries made on-site inspections of the interested party's property. Members had been taught by department personnel to spot habitat deficiencies. Suggestions ranged from, "Don't burn your ditch banks" (spring and fall "weed" burning has historically destroyed thousands of acres of pheasant habitat) to "We'll help you develop a habitat planting program that will benefit the pheasants."

In addition, a 40-minute slide show on the Bitterroot Pheasant Restoration Project was developed for use in schools, at meetings, and on television. Numerous publications, booklets, and other sources of pheasant habitat information were developed or gathered for the committee to pass out.

As of spring 1982, 163 landowners were working to improve pheasant habitat on their land. In all, over 323 individuals and groups have been involved—including landowners, 4-H members, and school groups. A rewarding part of the program has been that so many young people and adults have become interested and informed about the key to the pheasant's future: habitat. Information about the importance of habitat is provided, and the various groups also receive equipment; loans of incubators and rearing pens; feed, and instructions on how to care for and release the birds.

To get landowners started on the habitat projects and see them through, various incentives are offered. Initially, hatchery-raised birds and/or eggs were offered to participants with adequate habitat. During the first two years of the project, over 800 eggs have been supplied by the department to landowners, 4-H'ers, and students who hatch, raise, and release birds, under supervision of the RCFWA. Over 300

Nick Kramis (left) and Wes Woodgerd assist in pheasant trapping on the Lee Metcalf National Wildlife Refuge. Almost 300 surplus birds have been trapped on the Refuge and distributed to landowners cooperating in the Bitterroot Pheasant Restoration Project (photo: Christine Johnson).

11-week-old chicks have been given to the program by the State Bird Farm in Warm Springs.

However, the bird farm has recently been closed because of both financial and biological considerations. This shouldn't pose a major problem to the program because members have already begun trapping wild pheasants from the Lee Metcalf National Wildlife Refuge. Birds from the refuge have the advantages of being used to the Bitterroot environment and to natural food sources. The refuge, in the heart of the Bitterroot, offers excellent habitat; since no pheasant hunting is allowed, the surplus birds are available for the restoration project. The U.S. Fish and Wildlife Service granted permission to trap and transplant the birds, and it, along with the DFWP, coordinates the operation. During the past two winters, 290 wild pheasants have been trapped and distributed to landowners involved with the program.

Even though the State Bird Farm is closed, the department continues to provide assistance to organizations wanting to work with landowners on pheasant habitat improvement. This assistance is limited because of other higher wildlife priorities statewide.

Because winter food and spring nesting cover have been identified as the most common habitat deficiencies in the Bitterroot, many of the habitat enhancement projects have been directed toward these areas. In 1981, the DFWP purchased 600 pounds of seed wheat; the committee distributed it to landowners to plant in small plots, leaving it unharvested as a winter food source for pheasants. In many areas, landowners were encouraged to consult the U.S. Soil Conservation Service (SCS) for advice and assistance with wildlife habitat planning. The SCS personnel can recommend types of cover, fencing plans, etc. at no charge and assist landowners (owning over 10 acres) with ordering inexpensive shrubs and seedlings from the State Forest Nursery. Several landowners in the Bitterroot have also taken advantage of a cost-share program for fencing to protect their new plantings and habitat areas from livestock. (Landowners interested in this type of assistance should contact their county's executive director for the Agricultural Stabilization and Conservation Service [ASCS]. The ASCS may cost-share a percentage of approved wildlife-oriented projects, on a one-time basis.)

As with most projects of this sort, there have been some stumbling blocks. The subject of hunting came up at the committee's very first meeting. And the pros and cons of asking landowners to guarantee hunting were debated during several subsequent meetings. The committee decided not to require landowners to guarantee hunting on their property, thus leaving the hunting question to each individual. Contrary to some predictions, there has not been a stampede by landowners to post their land or to prohibit hunting.

Like so many sportsmen-oriented wildlife assistance programs, the Bitterroot Pheasant Restoration Project has made progress because of the voluntary participation of its members and landowners. Countless donated hours of planning, plowing, and planting have helped hold costs down. Total costs incurred by the committee in 1981 were only about $500 (for rearing and trapping birds, pen materials, game bird feed, private mileage, and miscellaneous supplies). In most cases, the actual habitat plantings and fencing were done by the landowners themselves.

One cannot overlook the fact that the nature of land ownership in the Bitterroot lends itself to this type of habitat improvement program. Progress is more likely in an area with many small-acreage holdings rather than an area with very large ranches.

After just two years of effort, the improvement in pheasant populations is detectable. Pheasant crow counts are used as an index of cock pheasant abundance during the breeding season. Over the years, they have provided department biologists with an indication of pheasant population trends. From a 1963 high of 18 crowing cocks per stop along the route, the crow count plummeted to an average of one crowing cock per stop in 1972. In spring 1981, after one year of the pheasant restoration program, crow counts averaged 5.1 per stop, the highest they had been since 1964. The spring of 1982 showed another increase, to 6.9 calls per stop. Progress has been complemented during this period by several mild winters.

But progress of the program can't be measured only in terms of crowing cocks or birds in the hunter's bag. How many people's awareness and concern has been influenced by these activities? How many young people will grow up to have a respect and understanding for the wily ringneck and for the important concept of habitat? And how many other sportsmen and landowners will become caught up in the program and do something for Montana's most popular game bird and its habitat? ■

MUZZLELOADERS: A New I

by Jim Lotan

"BUT JIM, this is 1980!" my well-meaning friend Denny Schutz explained when he saw my muzzleloading rifle. "Nobody handicaps themselves like that. You have *good* rifles in your gun rack. Why not take advantage of everything you can?"

Why indeed? Why do some hunters handicap themselves by failing to take advantage of the last 150 years of firearms technology? The answers are complex, and probably vary from individual to individual. But I'm sure that all muzzleloading enthusiasts would agree that hunting with primitive firearms can add a new dimension to precious hunting days.

My own interest in muzzleloading originated from my studies of the history of the northern Rocky Mountains—particularly the journals of the early explorers and trappers. I can remember reading Osborne Russell's "Journal of a Trapper," in which he told of his first experience killing game for his supper with a muzzleloading rifle. I wondered what it would be like to hunt as he did.

At that time I was naive enough to think that I could go out and buy an original rifle at a price within my budget. I soon found that it would cost a small fortune! But in the process of looking for a rifle, I discovered that many people have kept alive the skills of the longhunter, the voyageur, the mountain man. I discovered "buckskinners"—men and women who have studied not only the guns of early-day hunters, but the clothing, shelter, cooking gear, or whatever else one would need to relive the times of the early hunter. These people reenact, to the extent possible, the sights, sounds, smells, and feelings experienced by an Osborne Russell, a Joe Meek, or a Jim Bridger. They have also created a market for modern-day replicas of the old guns, custom-made copies, and even contemporary originals.

Of course, I was predisposed. I was a hunter long before my studies of the journals of early-day explorers and trappers. I was initiated into hunting by oldtimers in red and black woolens who swore by their .44-40's and .38-55's. These oldtimers grudgingly tolerated modern "high-powered rifles." I hunted for years with an open-sighted, lever-action .32 Special and shot deer and elk with it. Finally I broke down and purchased a .30-06 from Dave Kundert, a barber in Bozeman. This wasn't a hasty decision. The deliberations of this purchase took over a year before old Dave clinched his sale!

I then got scientific about things and bought a scope, started handloading, and really concentrated on accurate shooting. With tailor-made handloads, glass-imbedded stock, and years of meticulously recording elk movements in the Gallatin Canyon, I managed to shoot a few more elk—usually at 50 to 70 yards distance.

Once after struggling for a full day and half a night to get a bull elk home, I discovered that one of my high velocity "scientific" shots had destroyed almost a full front shoulder. I was a bit miffed at losing so much of my hard-earned meat. In subsequent reloading, I backed off on the amount of powder in my handloads and continued to put meat on the table. I began to chide my brother, Larry, about not needing to use 75 grains of #4831 powder in his .300 Winchester Magnum to shoot an elk. I was mentally prepared to begin black powder hunting and didn't know it.

Once I found that black powder rifles were available, it didn't take long before my pasture was filled with white smoke. I discovered that I would rather shoot my muzzleloader one time than shoot a whole box of shells with my cartridge guns. The

ook at Old Firearms

sound, the smoke, the ritual of loading all contributed to my conversion. It wasn't too long after this that I left my very enjoyable job as a research forester in Bozeman and was assigned to the Northern Forest Fire Laboratory near Missoula where there existed a whole company of black powder enthusiasts. The education of Jim Lotan continued.

One day two of my Fire Lab friends, Rick Oberheu and Pat Hartless, and I trekked into the Garnet Range for some black powder hunting of mule deer. We went in different directions and I soon found myself playing cat and mouse with several deer in a dense stand of Douglas-fir on a north-facing slope with many interlacing game trails. It was a mild, wet day with perfect conditions for quiet hunting. I was having a ball watching deer sneak past me first one way and then another. I moved only a step at a time—listening and watching. Soon I discovered some curious deer that were actually stalking me. Two does were following me only about 30 or 40 feet behind. When I stopped and turned they ran downhill. No sooner had the does disappeared when I saw a buck staring at me only about 30 feet away. I soon shot my first big game with a muzzleloader. I then had the fun of reloading under pressure. I'm sure glad, however, that it wasn't because a Blackfeet warrior had his eye on what remains of my topknot. I think that I only got about half of the measured powder down the barrel, but reloading really wasn't necessary because the soft lead ball at close range had done the job. And, I had done it just like Osborne Russell had. It was a quality hunt, especially after I rounded up a couple of *engagés* to help me get the deer back to the rig. The significant thing about this hunt was that it was necessary to stalk close to the game, and in hindsight that is what made it such a satisfying experience.

Buckskinners (left DFWP photo: Tom Warren) are men and women who study not only the guns, but the clothing, shelter, cooking gear, and whatever else is needed to relive the times of the early hunter. H.P. "Hoot" Gibson killed this four-point Sonoran whitetail buck with one shot from his .50 caliber muzzle-loading rifle.

What about the effectiveness of black powder firearms in big game hunting? If one develops the skills required to stalk game and to use muzzleloaders properly, they can be very effective. Let me illustrate. In my reading of numerous articles about guns, I've always gotten the impression that a 220-grain bullet in a .30-06 is a brown bear load. Realizing that elk are hard to put down and not wanting to ruin any more front shoulders, I decided to use this heavy-point bullet for elk. The next fall I shot a five-point bull elk with a 200-grain bullet in my .30-06 from about 60 yards. The shot was well placed and, sure enough, the elk wasn't going anywhere. The next elk I shot was with a .50 caliber round lead ball with 90 grains of FFFg black powder in a home-made muzzleloader. The range was 90 yards. The shot was well placed. Except for the additional 30 yards, it was almost a repeat performance. When I got to the elk, sure enough, it wasn't going anywhere. Within range, black powder rifles are very effective.

For years now, my favorite hunting spot has been "Wilson Creek." Whenever anyone has asked me where I shot my elk, I've resisted the temptation to say, "Right in the heart!" and told them instead, "Wilson Creek." This past season Ralph Wilson, an engineer at the Fire Lab in Missoula, was lucky enough to draw a bighorn sheep permit. Right from the start Ralph said that he would use his muzzleloader. Ralph's gun is a custom rifle that he made using a .54 caliber Douglas barrel, 36 inches long and 1⅛ inches across the flats. Now this gun weighs about 11 pounds! Few men would be able to pack it over hill and dale while looking for sheep. It is not exactly recommended for sheep hunting, but Ralph is built like he could hold his own with the Green Bay Packers. And pack it he did. Yessir, right up the Main Fork of "Wilson Creek." The sheep had a full curl and measured 36⅛ inches. Ralph used a .54 caliber round ball with 140 grains of FFg black powder. Ralph feels that the quality of his hunt was greatly enhanced because of the need to stalk to close range. He was close to six different rams—several were within 50 yards and one was only 7 yards away. He spent 16 days before filling his tag.

Another black powder friend of mine, H.P. "Hoot" Gibson, recently moved into the Bitterroot Valley after his retirement from the Forest Service. He has hunted all over the country during his forestry career. His feelings about hunting are similar to Ralph Wilson's and my own. He once shot a nice Sonoran whitetail buck while hunting in "Wilson Creek" in Arizona. Hoot's rifle is a custom beauty he made using a .50 caliber Douglas barrel with a 1-in-66-inch twist. He shot his Sonoran buck with 100 grains of FFg powder. The buck was standing broadside about 65 steps away, and it dropped in its tracks.

Hoot, in addition to being a fine craftsman, is a rather thorough sort of guy. He recovered the ball and took some measurements. The .50 caliber ball had expanded to a little over an inch and had lost only a bit more than 10% of its weight. It had expended all of its energy within the animal. As he put it, "It would be difficult to ask for better bullet performance or results."

How about accuracy? Let me tell you, muzzleloaders can shoot right plumb. Two- and three-inch groups at 100 yards are not at all uncommon for an expert rifleman. Ralph Wilson has won more than one shooting match. He regularly shoots one-inch groups at 50 yards.

One thing is certain. No firearm, regardless of its power or how well equipped for sighting, will ever make up for carelessness or lack of skill on the part of its user. All hunters should know the habits and anatomies of the animals they hunt. They should be able to stalk to within reasonable shooting distance and be able to place the ball in a vital area for a quick and humane kill. This is true regardless of the rifle carried.

Of course, the rifle should match the game encountered. The early explorers and trappers quickly found that the large calibers, such as the .50, .54, or .58 calibers, were needed for effective hunting of elk, grizzly bear, and buffalo. These calibers in muzzleloading rifles are adequate for big game hunting in Montana. A .50 caliber muzzleloader loaded with a .490 round ball (weighing 175 grains) and 100 grains of FFFg black powder will produce a muzzle velocity of about 2,000 feet per second in long barrels.

Although frowned upon by "pre-1840" enthusiasts, the elongated pure lead bullets such as the Minié ball (or some modern adaptation of it) are reasonably efficient projectiles and retain their velocities well. Therefore they extend the range of a muzzleloader somewhat. I use the round ball because it is effective within its range, because it is accurate, and because it is what Osborne Russell used.

Muzzleloading rifles with round balls are effective out to 150 or even 200 yards if the hunter is skilled with his rifle and is good at estimating ranges. And if we are talking of elk hunting, at least a .50 caliber should be used. A .54 caliber is a good compromise between flat trajectory and energy. Minié balls will extend this range, but with open sights and problems in estimating distance, we're not talking about much extension.

Because of the need to develop the necessary stalking and shooting skills, the hunt does not begin with opening day, or even the weekend prior to opening day. It is a year-round proposition. If one adds to this the research, study, and preparation required to equip oneself with authentic clothing and gear, then there is enjoyment far beyond the five weeks or so available in Montana's general season. I find that black powder enthusiasts often will make a long-distance phone call just to share with friends a newly discovered fact of authenticity. Black powder fast becomes a way of life.

When my two sons, Eric and Leif, and I go hunting, we pack the horses, don our capotes, and step into the past. We have had great pleasures in sensing an approaching storm (without the nightly television forecasts), gathering an extra supply of wood, and crawling into our snug tipi. Talk about a quality hunt! We have camped as Osborne Russell did. And the boys have had an object lesson in Montana history.

The current situation in Montana is that we have no special seasons for muzzleloader hunting. Can we muzzleloader hunt? You bet! We have an ample general season plus opportunities to apply for special permits. We are blessed with good hunting. There is absolutely no reason for people not to hunt with muzzleloaders in Montana.

Do we need special seasons in Montana? The Fish and Game Commission would need special legislative authority to establish a special muzzleloader season. I personally have never felt the need for such a season. However, I get some disagreement from fellow black powder shooters, who, like people everywhere, come in various shapes, sizes, colors, and opinions.

Some black powder hunters feel that a special season would heighten the aesthetic aspects of the sport if the requirement for wearing fluorescent orange were waived, as it is for the special archery season. But tests have proven that wearing fluorescent orange apparel lessens the danger of a person being accidentally shot—and Montana law requires that rifle hunters wear 400 square inches of fluorescent orange (see Jan./Feb. 1982 *Montana Outdoors).* Nonetheless, blaze orange is certainly not indigenous to the trapping era! Putting on a fluorescent orange vest over a capote somehow doesn't seem right. It is a trade-off we make for modern-day safety.

Another point that black powder enthusiasts make is that because of their limited range, muzzleloaders could be safely used in situations where game populations exist close to inhabited areas. However, such special provisions would also require legislative authority.

I have concerns over the opening of a special season in that it may encourage some people to participate solely for the increased opportunity to shoot game—i.e., the game hog mentality. Not that increased hunting opportunity is bad in itself. I have always greatly admired archers for the skills required to take game with bow and arrow, and I have never begrudged them their increased opportunities for getting outdoors and into our fields and forests.

But muzzleloaders are being mass-produced and sold in a variety of stores, often by clerks with about as much knowledge of muzzleloaders as a New York taxi driver has of hitching up a team of horses. With a special season, we might have many people in the field who do not have the skills to stalk within range, to develop proper and accurate loads, and to select safe, well-designed firearms. Admittedly, this can happen even with the current regulations, but the muzzle-loading hunter afield during today's general season is a determined soul. He must be able to withstand the hard questioning of my skeptical friend Denny Schutz, a very pragmatic man.

In the meantime, the Ralph Wilsons, the Hoot Gibsons, and the Jim Lotans are going to reach past their scope-sighted, customized .30-06's for their front loaders. They will don their skins and capotes and trek back in time. My son Eric was hiking into camp late one evening when he encountered a rancher who had been riding the trails surrounding our primitive camp. I had spent the previous week there with two of our saddle horses and I was dressed in my mountain-man garb. Several times during the week I had met the rancher riding the trails. The rancher queried Eric as to why he was going in when it would soon be dark. Eric said that he had a camp down in "Wilson Creek." The old boy stated, "Ya! There is some old coot down in there dressed as a mountain man. Watch out for him. He might be dangerous!"

Not dangerous, my friend—a bit romantic perhaps, but really a pretty gentle soul having his own personal trip into the 1800s. And except for the fluorescent orange, he is trying to be authentic. He has found a way to make the most of today's hunting opportunities. Want to join him?■

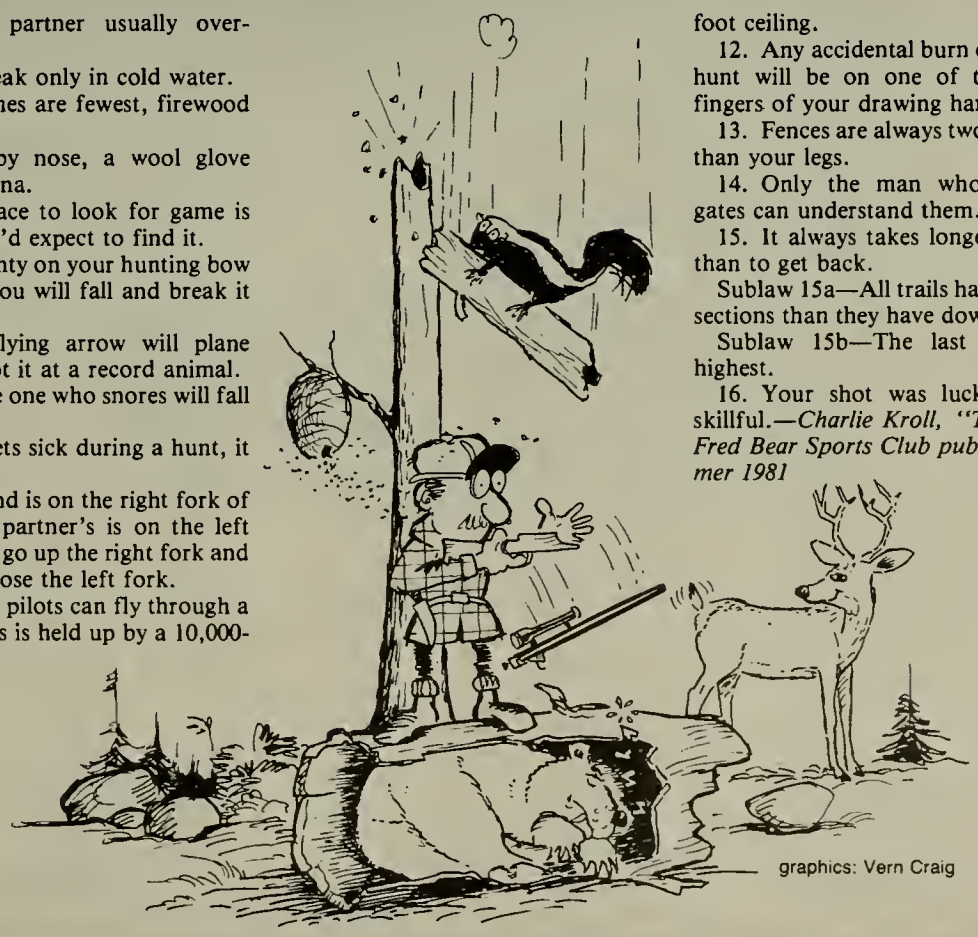
Immutable Hunting Laws

1. A hunting partner usually oversleeps.
2. Hip boots leak only in cold water.
3. When matches are fewest, firewood is wettest.
4. For a drippy nose, a wool glove beats any bandanna.
5. The first place to look for game is the last place you'd expect to find it.
6. If the warranty on your hunting bow is for one year, you will fall and break it after 376 days.
7. Your best-flying arrow will plane badly if you shoot it at a record animal.
8. In camp, the one who snores will fall asleep first.
9. If anyone gets sick during a hunt, it will be the cook.
10. If your stand is on the right fork of a trail and your partner's is on the left fork, all does will go up the right fork and all bucks will choose the left fork.
11. Other bush pilots can fly through a pea-souper. Yours is held up by a 10,000-foot ceiling.
12. Any accidental burn or cut during a hunt will be on one of the first three fingers of your drawing hand.
13. Fences are always two inches higher than your legs.
14. Only the man who builds farm gates can understand them.
15. It always takes longer to get there than to get back.

Sublaw 15a—All trails have more uphill sections than they have downhill sections.

Sublaw 15b—The last hills are the highest.

16. Your shot was lucky. Mine was skillful.—*Charlie Kroll, "The Big Sky," Fred Bear Sports Club publication, Summer 1981*



graphics: Vern Craig

Two Treasures of Treasure County

by Ken Walcheck

Whoever put a handle on Treasure County named it well. It has two gems—Norris Cole and Harold Miller—capable of competing with the best the world has to offer.

Every time I travel to the Sarpy Creek country to visit these two "retired" ranchers, I think of two cottonwoods that stand, firmly entrenched in the rich alluvial soil, near the junction of the Tongue and Yellowstone rivers. To the unperceptive eye, the towering trees are nothing more than gnarled wooden blocks of questionable value. To the more sensitive viewer, the giant cottonwoods represent something else—a sweeping grandeur, a grandeur to be savored, yet one that cannot be grasped or brought to heel.

Norris Cole (left) and Harold Miller (DFWP photo: Ken Walcheck)

Like the stately cottonwoods, the two patriarchs are products of the Sarpy Creek country. You can see this in their faces: deeply wrinkled and weathered, clear-eyed, serene, alight with the age-old wisdom that expresses a deep affection for eastern Montana. There's no doubt that their roots run deep in the Yellowstone basin.

In July 1908, D.E. Cole boarded a train in Kansas carrying immigrant homesteaders West. He headed to Sanders, Mont., with a newly acquired wife, four mules, a couple dozen chickens, a walking "breaker" plow, a piano, and a collection of household goods. The drawing card for Cole and other settlers was 4 million acres the federal government had purchased in 1905 from the Crow Indians. The following year, identical twins—Norris and Morris—were born to the Coles.

Harold Miller, a year senior to Cole, didn't reach the Sarpy Creek area until the age of 6. Like the Coles, the Miller family decided to stake its future in eastern Montana. "I look back," reminisces Miller, "and what my Dad paid for that place wouldn't buy a wheel on a tractor now."

During their tenure in eastern Montana, the two old-timers have observed some significant changes in the wildlife scene. A comment frequently voiced by some sportsmen today—"Hunting sure ain't like it was in the good old days"—doesn't hold much water with Cole and Miller.

"Such statements just aren't true," Miller declares. "I was 12 years old before I first saw a deer. There were no antelope left to speak of in this country, and to kill a goose was unheard of. There is absolutely no comparison with the old days, and I wouldn't care to go back and relive them." Miller's memory is well-reflected in the Montana hunting regulations of the time. During the early 1920s, 16 counties in eastern Montana were closed to deer hunting. In 1925, the Biological Survey (now the U.S. Fish and Wildlife Service) surveyed 44 areas in Montana and estimated there were only about 3,000 antelope.

It has been well-documented in the Sarpy Creek country and elsewhere that a lot of people tried to scratch a living out of marginal farming operations in the early 1900s. The exploitation of the land, of which wildlife was a product, reached a magnitude beyond comprehension. By 1920, many of the settlers who had filled the Sarpy Creek area began to move on as they realized that a 320-acre home-

continued on page 25

The Catchall

Aasheim Named Conservation Education Chief

Montana Department of Fish, Wildlife and Parks Director Jim Flynn has announced the selection of Ron Aasheim as administrator of the department's Conservation Education Division.

Flynn commented that the department has identified improved information and education services as high priorities for the future. Flynn said, "It is our goal to better inform the public." Aasheim will have responsibility for this effort, which includes *Montana Outdoors,* film production, youth education, media coordination, and other information and education efforts of the department.

Ron Aasheim (photo: Tom Warren)

Aasheim has been with the department since August 1975 and has worked with the department's Parks Division in various capacities. Prior to joining Fish, Wildlife and Parks, he spent two years with a private firm in Bozeman in the field of natural resource consulting. A native Montanan, he holds bachelor's and master's degrees from Montana State University.

He assumed his new duties July 6. He replaces Steve Bayless, who resigned in February to accept a position as Montana director for Ducks Unlimited.

McLucas Wins MWF Award

Jim McLucas, a veteran of 35 years with the Montana Department of Fish, Wildlife and Parks, was named "Montana Conservationist of the Year" by the Montana Wildlife Federation (MWF). The award was presented at the group's 47th annual meeting, conducted in West Yellowstone in June.

According to MWF President Rich Day, Bozeman, the award is presented "to recognize people doing an outstanding job for conservation in Montana."

McLucas joined the Montana Fish and Game Department (now Fish, Wildlife and Parks) in 1946 and retired in August 1981. During that time, he helped trap and transplant about 7,000 antelope, 6,000 elk, 1,000 mountain sheep, 1,000 mule and white-tailed deer, and 450 mountain goats. A pioneering effort, the trapping and transplanting of wildlife to new ranges was worked out as the program moved along, and McLucas was instrumental in developing methods still used today.

He was hired as a deputy game warden-at-large in 1946, sent to Kalispell, and transferred to the Game Management (now Wildlife) Division. He was named chief of the trapping and transplanting program in 1950.

His achievements go far beyond numbers of animals trapped and transplanted, however. Because of his efforts with national motion picture and television producers, "Wild Kingdom" and "Animal World" have featured Montana's trapping and transplanting program. This helped place the program "on the map" and his work with outdoor writers and photographers helped secure its reputation as a model for other states.

Since retirement, McLucas has continued writing a history of the program.

His award was accompanied by an original bronze of a bugling bull elk by artist Bill Ohrmann and sponsored by Missoula businessman Fred Mello.

In addition, the MWF chose Nick Kramis of Hamilton as its "Sportsman of the Year." Kramis was cited for his work with pheasant habitat restoration in the Bitterroot (see "Pheasants for the Future" on page 2). He is particularly well-known for his efforts with young people and toward better landowner-sportsman relations. He is a member of the Ravalli County Fish and Wildlife Association.

The National Wildlife Federation's "President's Award" to the top MWF-affiliated club went to the Libby Rod and Gun Club. Members were singled out for their work toward preventing construction of a reregulation dam downstream from Libby Dam.

Department Wins Three ACI Awards

The Montana Department of Fish, Wildlife and Parks has won three awards in an international competition sponsored annually by the Association for Conservation Information (ACI). This year's competition included 173 entries in 14 categories. ACI is an organization of outdoor writers and public information specialists from state, federal, and Canadian resource agencies. The group is concerned with improving the communication, information, and education skills of its member agencies.

Montana Outdoors won first place in "Color Photography" for a series of five photographs used in the Nov./Dec. 1981 Special Pictorial Issue. The entry included photographs by Mike Aderhold, Kalispell; Tony Caprio, Missoula; Steve Wirt, Whitefish; Jerry Manley, Butte, and Mike Logan, Helena.

In "Television Public Service Announcements," the department was awarded second place for a PSA dealing with landowner-recreationist relations, "What's It Worth?"

In a "Special Efforts" category, the *MO* Special Pictorial Issue took second.

Wildlife Society Honors Weigand

The Wildlife Society awarded its 1982 Publication Award for a monograph to Dr. John P. Weigand, chief of the department's Wildlife Research Bureau in Bozeman. The award, for "Ecology of the Hungarian Partridge in North Central Montana," was presented to Weigand at the society's annual banquet in Portland in March. The ceremony was held in conjunction with the 47th annual North American Wildlife and Natural Resources Conference.

The award is the first of its kind to be presented to a department employee and also the first such award for a department-sponsored publication.

In receiving the award, Weigand credited the Wildlife Division and the De-

partment of Fish, Wildlife and Parks with supporting a strong wildlife research program. The research program, which began in the early 1940s, has been strengthened and broadened during the past 40 years, he stated. Weigand also characterized research as the "tomorrow mind" rather than the yesterday or today mind. He also noted that "hunters share in this honor. Unlike their antithesis, hunters put up their money for this research by purchasing hunting licenses, firearms, and ammunition."

A native of Wisconsin, Weigand has worked for the department for most of his professional wildlife biologist career, which began in 1959. He holds a B.S. from Wisconsin State College at Stevens Point, an M.S. from Michigan State, and a Ph.D. from Montana State University. He has served as a game management biologist in Miles City and Great Falls, a game research biologist in Baker and Choteau, a wildlife biologist supervisor in Bozeman, and has been chief of wildlife research since 1978.

Weigand has written and co-authored 22 technical and popular articles; eight have appeared in *Montana Outdoors* (including the Hungarian partridge article in this issue).

The Wildlife Society's membership of nearly 10,000 is comprised of research scientists, educators, communications specialists, conservation law enforcement officers, resource managers, and administrators from more than 70 countries.

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Festival Deadline: February 4

The deadline for submitting films for the Sixth Annual International Wildlife Film Festival is Feb. 4, 1983. Sponsored by the University of Montana student chapter of The Wildlife Society, the festival encourages filmmakers to produce "better" wildlife films, both in technical quality and content. As the festival sponsors say, "These films may be the only contact many people have with wildlife, and so the messages they convey are critical."

Entries must have a predominantly wildlife theme and must have been produced or released during calendar year 1982. Judging will be conducted before the festival, scheduled Feb. 25-27 at the UM campus in Missoula. During the three-day event, winning films will be shown and panels and workshops of filmmakers and biologists will also be featured.

For additional information, contact: Wildlife Film Festival, Wildlife Biology Program, University of Montana; Missoula, MT 59812 (406/243-5272).

Book Reviews

MONTANA'S BOB MARSHALL WILDERNESS, by Roland Cheek, Skyline Publishing Co., P.O. Box 1880 F; Columbia Falls, MT 59912, 80 pages, $20 hard cover, $7.95 soft cover.

Roland Cheek, who lives in northwestern Montana, knows the Bob Marshall Wilderness well and loves it very much. His book describes many of the outstanding characteristics of this pristine area.

I enjoyed reading it. I have roamed this remote region many times over nearly 50 years and consider it my favorite mountain country.

In addition to being the first work of its kind about the Bob Marshall country, this book is also very timely. The Bob Marshall Wilderness now faces serious threats from possible gas and oil exploration and development. Cheek goes into some detail regarding the current urge for gas and oil exploration which has touched off a wave of national concern. He points out that this could well destroy much of the precious wild character of what many have come to think of as the "crown jewel" of the nation's wilderness system.

The author has divided the book into several short, but interesting, sections. The first has to do with the broad glacier-formed valleys that lie back among the mountain ranges. They provide a pleasing gentleness to an otherwise rugged topography. He speaks of the rivers that flow, wild and free, through those great valleys and canyons. Lakes make up another section. He believes they are all beautiful and the glacier-carved cirques that cradle several of them lend a special charm.

The author sometimes thinks of these mountains as "staircases to heaven." His descriptions of the local geology, in layman's terms, point out the work of ancient forces that brought about this spectacular topography, including the well-known Chinese Wall.

His section on plants and animals of the area, although not in great detail, brings out interesting information. He is impressed, as I have always been, with the abundance of mountain flowers. He stresses the importance of maintaining this superb wilderness to provide an undisturbed region where birds and animals may continue to flourish in a truly wild environment.

He makes the important point that the Bob Marshall Wilderness is contributing to the survival of several endangered and threatened species—peregrine falcon and Rocky Mountain wolf (both endangered), the grizzly bear (threatened), as well as the westslope cutthroat (a trout of special concern).

In regard to human use, he indicates that Indian people visited these mountain valleys long ago. Early explorers, trappers, and a few hardy homesteaders also came this way, although evidence of their activities has, for the most part, been obliterated by time.

The author mentions that a search for solitude and high-quality recreation now brings outdoor-loving people into the area. Like their pioneer predecessors, they come only by foot or on horseback. Due to its vastness, there is still a great feeling of remoteness.

The book hints at the presence of virtually unexplored caverns and also talks of river rafting and big game hunting. It mentions possible winter travel, for those well-equipped for such hardy adventures.

This book is enjoyable, easy to read, and well-illustrated, including a map and many color photographs. If I have any criticism, it would be that several of the enlargements didn't print as sharp as they

probably were in the original transparencies.

Roland Cheek has done well with a very beautiful subject. For those who have seen the Bob Marshall, the book will bring back a lot of memories. For those who have not yet visited this lovely place—or who may never have the opportunity to do so—it will create a lot of dreams.—*Bob Cooney, Helena*

UPLAND BIRD HUNTING, by Joel M. Vance, an Outdoor Life book distributed by E.P. Dutton & Co., Inc., 2 Park Ave., New York, NY 10016; 1981, 311 pages, illustrated, $17.95, hard cover.

I thought Charley Waterman had written the last word on upland bird hunting in 1972, with publication of his excellent book, "Hunting Upland Birds." But Joel Vance has written a book to put on the shelf right beside it. Called "Upland Bird Hunting," it contains 31 chapters that run the gamut from shotguns and bird dogs to the various species of upland birds and their habits. Vance, as anyone who has worn out a few pairs of boots stomping the uplands will quickly be able to tell, is a bird hunter to the core. His information on bird shooting rings consistently true. But perhaps just as important, the reader comes away with a better appreciation of hunter ethics and wildlife conservation.

Beyond providing a wealth of valuable information, Vance can spin a hunting yarn that puts the reader in the field right alongside him, be it playing cat and mouse with a boss gobbler or maneuvering like a military tactician through a favorite quail cover. His chapter, "Boss of the Ridgetops," is as good a turkey hunting tale as you are likely to find.

For those of us in the West, Vance provides some solid information on hunting the prairie birds, but he doesn't pretend to be an expert on blue grouse, chukar partridge, or Gambel quail. He concentrates instead on the species he knows best: pheasants, bobwhites, ruffed grouse, turkeys, doves, and woodcock.

Each dose of factual information is liberally spiced with vintage "Vanceisms"—we learn, for example, that "Seeing a game bird before the flush always lets a hunter's doubts flourish like okra in Oklahoma...." and that without a dog, "Your chances of finding a dead woodcock, even one lying in plain sight, are almost as good as those of having Raquel Welch call you up tonight to go out for pizza." We also find that wild turkeys "can hide behind a new oak leaf no bigger than a mouse's ear, they can walk over a dumptruck-load of popcorn, broken glass and crumpled wrapping paper as if it were foam rubber. But turn a turkey loose on a chunk of oak forest floor when he's hungry and satisfied there are no predators around and his scratching will sound like an alley cat orgy on a tin shed roof."

All in all, "Upland Bird Hunting" is informative, refreshingly irreverent, and just plain fun to read. It belongs in every bird hunter's library.—*Dave Books*

HUNTING THE GREAT PLAINS, by John Barsness, Mountain Press Publishing Co., P.O. Box 2399, Missoula, MT 59806; 1979, 164 pages, $6.95, soft cover.

Although "Hunting the Great Plains" has been in print for a few years, I didn't happen across it until recently. I wish I had found it sooner. Although it's on the thin side for a book of this sort (164 pages), it contains more useful information than most books twice its size. It's also easy on the pocketbook—my copy cost $6.95 in a local bookstore. You won't find many books this useful and well-written for less than the price of a box of duck loads.

The book is divided into three major sections—big game, upland game, and migratory birds—each of which contains details on the various species, types of terrain, hunting tactics, and equipment needed. There's a "where to go" section at the end of the write-up for each game bird or animal. The author has also included special chapters on rifles and shotguns for hunting the plains, on vehicles and camping, and on dogs for open-country hunting.

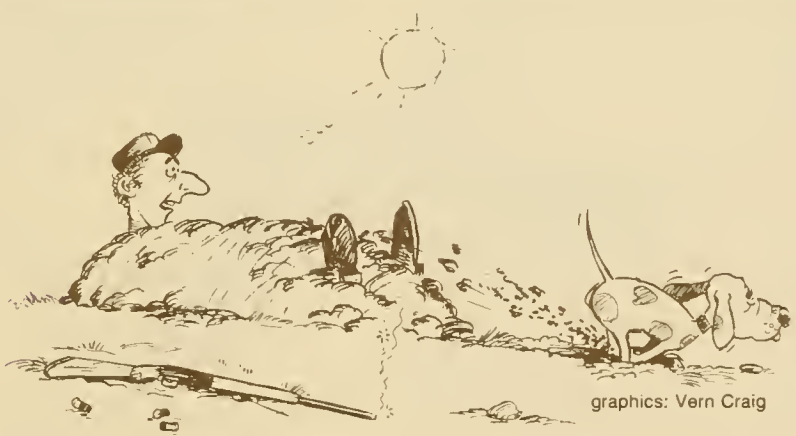
While Barsness draws on his hunting experiences in several of the Great Plains states, his intimate knowledge of the prairies and badlands of Montana make this book especially applicable to people planning to hunt in Montana. His love for the country shows through in the closing lines of the introduction: "On a single fall day in eastern Montana a few years ago, I saw mule deer, white-tailed deer, pronghorn, sharp-tailed and sage grouse, Hungarian partridge, pheasant, Canada geese, and mallard, teal, and pintail ducks. In a hike of two miles in the same area, I've traversed swampy tule marshes, thick hardwood timber, open grasslands, brushy coulees, and eroded badlands. It is that incredible variety of both wildlife and country that makes me wish I could be, at this moment, under an eastern Montana sky."—*Dave Books*

HUNTING AMERICA'S MULE DEER, by Jim Zumbo, Winchester Press, P.O. Box 1260, Tulsa, OK 74101; 1981, 358 pages, $14.95, hard cover.

As Jim Zumbo points out in his first chapter, of all the big game species in the West, the mule deer is far and away the favorite among hunters. Surveys indicate there are about 8 million mule deer in the West, and about half a million are harvested each year.

Given these statistics, if you hunt in the West, chances are you hunt mule deer. If so, you should have a copy of Zumbo's book. Currently an editor-at-large for *Outdoor Life,* Zumbo has hunted and studied the species in Utah, Idaho, Wyoming, Montana, Colorado, New Mexico, and Nevada. A forester and wildlife biologist by training, he has both the technical expertise and writing skill to offer a unique perspective on the hunting of this popular big game animal.

Based on his knowledge of mule deer habitats, Zumbo has devoted a separate chapter to tactics for hunting in each of eight basic habitat categories: aspen forests, pinyon-juniper, evergreens, the high brush, sagebrush, river bottoms, agricultural areas, and the desert. Additional chapters cover do-it-yourself hunts, outfitters and guides, firearms, optical equipment, scouting, bowhunting, muzzleloading, horseback hunting, getting the deer home, venison recipes—in short, anything you might want to know about mule deer hunting.—*Dave Books*



"Come now—everyone misses a shot now and then!"

Contributors

• Pheasants and pheasant hunting have been a part of life in the Bitterroot since pheasants were first introduced there around the turn of the century. But, as **Bill Thomas** writes, "...the recent trend in western Montana [pheasant populations] has been nothing to crow about." So a group of sportsmen from the Ravalli County Fish and Wildlife Association, area landowners, 4-H club members, and other interested citizens joined forces and their efforts have ensured "Pheasants for the Future." While the group has worked primarily to restore pheasant habitat in the Bitterroot, some other benefits have accrued: Many people have become more aware of the habitat needs of wild creatures; many young people have learned to respect and understand the wily ringneck and its habitat needs, and the program may well serve as a model for other such endeavors in other parts of Montana. Thomas' article begins on page 2. He is the department's information officer for Region 2 (Missoula) and worked with the Ravalli County committee on this project.

• **Jim Lotan** invites the reader to take "A New Look at Old Firearms." The first question most people ask is "Why?" Why would someone want to discard at least 150 years of firearms technology? As Lotan points out, the answers are complex, and they vary from individual to individual. But for him, it's a personal trip back to the 1800s. Besides, it is a year-round proposition. If one adds to this the research, study, and preparation required to equip oneself with authentic clothing, you have enjoyment far beyond the five weeks or so available in Montana's general season. Lotan is a research forester with the Northern Forest Fire Lab, Missoula. He is interested in black powder shooting and has used muzzleloaders—with some success—for 12 years. He particularly enjoys reading the original journals of trappers and explorers, using draft horses, and participating in wagon train and rendezvous activities. Turn to his article on page 6.

• **Ken Walcheck** has contributed two articles to this issue. Beginning on page 10, he profiles "Two Treasures of Treasure County." The two "gems"—Norris Cole and Harold Miller—are "capable of competing with the best the world has to offer," Walcheck writes. His poignant account traces the 70-year friendship of the two dyed-in-the-wool eastern Montanans and lists their opinions about and contributions to wildlife conservation. His second piece confronts the difficult problem of acid rain—"an odd-sounding, disquieting phrase to those of us who grew up thinking of rain as something blessed and purifying that drops gently from the heavens...."Instead, this "Scourge from the Skies" is being recognized as one of the most serious environmental dilemmas of the century, a dilemma with mind-boggling impacts. And one from which Montana does not appear to be immune. The article begins on page 34. Walcheck continues his duties as the department's information officer for Region 7 (Miles City).

• The Hungarian partridge is an upland game bird with which **Dr. John P. Weigand** is on a first-name basis. Weigand recently won The Wildlife Society's Publication Award for a monograph on the Hun's ecology (see "The Catchall" in this issue). And a shortened version of the monograph begins on page 27. "Montana's Cosmopolitan Game Bird" is so-called because it inhabits terrain ranging from lowland valleys, to sagebrush-covered plains, to grassy mountain foothills. Weigand explores the whys and wherefores of this seemingly incidental species, including its "close relationship with man and his use of the land." Weigand is chief of the Wildlife Division's Research Bureau in Bozeman.

*****

• Readers have two things to welcome in this issue's "Identification of Montana's Upland Game Birds" (page 15). First, the chance to become better acquainted with Montana's upland game bird species, as they are likely to be seen by hunters in the fall. And by no means second, the opportunity to once again view the skilled results of **Ron Jenkins'** brush. His front cover painting of Hungarian partridge, as well as his work in the guide, were done especially for this issue of *Montana Outdoors.* Jenkins' work has been exhibited all over the United States, and his illustrations have appeared in many magazines and outdoor-oriented publications. The Missoula artist is an avid fisherman and bird-watcher, and his strong feelings for wildlife are apparent in his work. Among his many contributions to *MO* are the "Grouse of Montana" paintings in the Sept./Oct. 1978 issue, his cover painting of Canada geese in Sept./Oct. 1979, and his rendition of canvasbacks in "A Montana Waterfowl Portfolio" in Nov./Dec. 1980. His signature is greatly anticipated in our pages, and the guide in this issue will enable the reader to understand why. Text for the guide was compiled by *MO* Editor Dave Books.

CHRISTMAS COMES SIX TIMES A YEAR when you give Montana Outdoors.

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• We're pleased to welcome back the talents of **Charles J. Fritz,** Billings. A small lake and surrounding woods near Mason City, Iowa, were his classroom for learning about nature; his understanding and appreciation for nature have grown and matured, which his work reflects. He has a one-man show scheduled Dec. 3-4 at Bochner Gallery in Des Moines; in Montana, his work can be seen at Crumbacher Gallery, Billings. His painting of a black Labrador and decoys, titled "Opening Day," was the front cover of the Fall 1981 L.L. Bean catalog. He operates Charles J. Fritz Sporting and Fine Art, P.O. Box 381; Billings, MT 59103. He has depicted one of Montana's finest fall traditions—pheasant hunting—on our inside front cover.

• We're pleased to welcome Great Falls artist **Dave Maloney.** His back cover watercolor depicts many of the things that cause autumn to be a favorite season. Maloney is a full-time artist, and has had over 25 one- or two-man shows throughout the Northwest and Canada. Among his many awards are those from the New Mexico National Painting Exhibition, the Watercolor Oklahoma National Juried Show, and the Canadian Cowboy Artist Show. He is featured in this month's issue of *Southwest Art,* which is devoted to contemporary western artists. A showing of his work is scheduled for November at the C.M. Russell Museum in Great Falls.

• **Elliott Eaton** has a special touch when it comes to capturing on canvas what it takes "To Make a Hunter." His watercolor illustrates John Madson's article, beginning on page 32. Eaton is a professional artist who has won many "Best of Show" awards. He has a one-man show scheduled at the Art Chateau, Butte, in February. Homestead Gallery in Park City is both his studio and home, and his work can also be seen at Artist's Union, Bozeman, and in several out-of-state galleries.

• Our appreciation to the following photographers: **Bob Cooney,** Helena, and **Jon Cates,** Missoula. And special thanks to **Vern Craig,** Helena, for his meaningful cartoons. And to **Ralph Krieg,** Helena, for his pen-and-ink illustration (page 24).

Identification of Montana's Upland Game Birds

compiled by Dave Books
paintings by Ron Jenkins

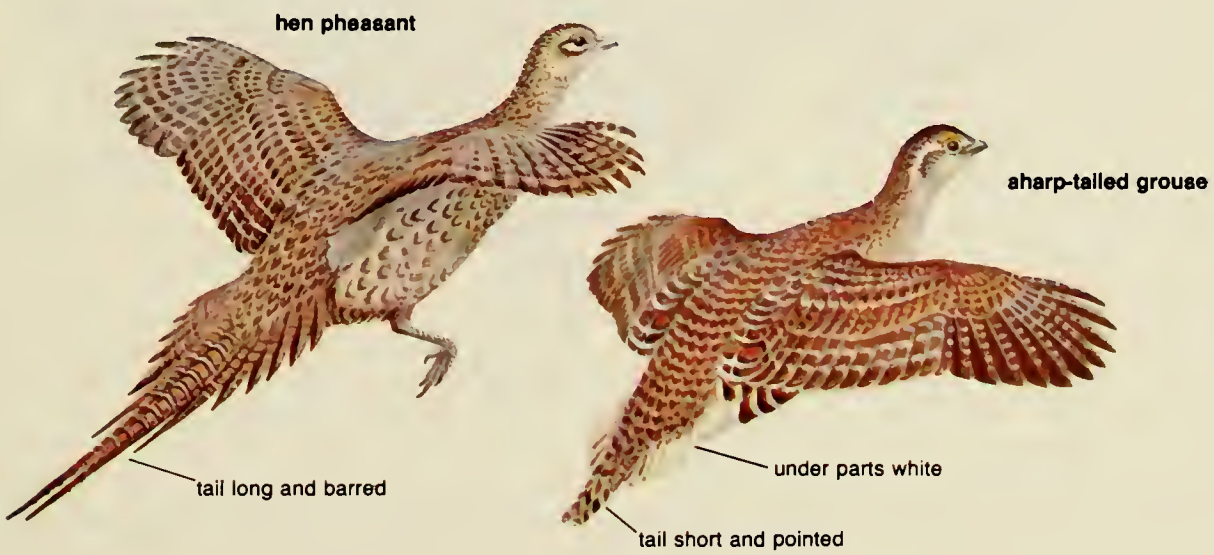
The following is a guide to help you identify Montana's upland game birds. It attempts to depict the birds as they are most likely to be seen by hunters in the fall, rather than in their colorful and distinctive spring mating postures. Although the white-tailed ptarmigan is not a huntable species in Montana, it is a resident upland bird and therefore has been included in this guide.

While many of our game birds, like the adult cock pheasant, are easily identified, others are more difficult, especially under field conditions. For example, hen pheasants (which are currently protected in Montana) and young pheasants of both sexes are sometimes mistaken for sharp-tailed grouse (see paintings below). This is an especially common mistake during the early weeks of grouse season in September when many pheasants have not reached maturity. The problem is compounded when a bird flushes some distance away, especially under poor light conditions. Experienced hunters, however, will immediately recognize the shorter tail and whitish belly of the sharptail (adult hen pheasants and young pheasants of both sexes are dull mottled brown throughout), and the characteristic *tuk-tuk-tuk-tuk* call of the sharptail when it takes flight.

Other problems sometimes encountered with upland bird identification include separating Montana's five species of grouse (especially the females of some species) and distinguishing between male and female turkeys during the spring gobbler season.

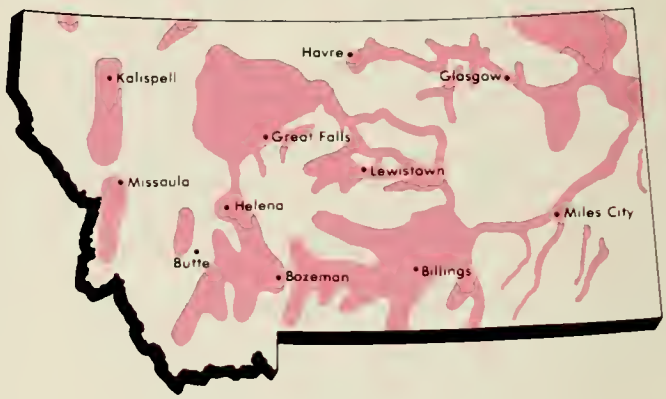
The bird descriptions borrow heavily from Paul A. Johnsgard's "North American Game Birds of Upland and Shoreline" (University of Nebraska Press, Lincoln, Nebraska, 1975). The range maps were prepared using maps from "Game Management in Montana" (Montana Fish and Game Department, Helena, Montana, 1971) as a starting point; these were updated by Dr. P. D. Skaar, Montana State University, Bozeman. Distribution of each species is indicated in color (magenta). When large areas are indicated, there may be population gaps and sparse populations in certain locales.

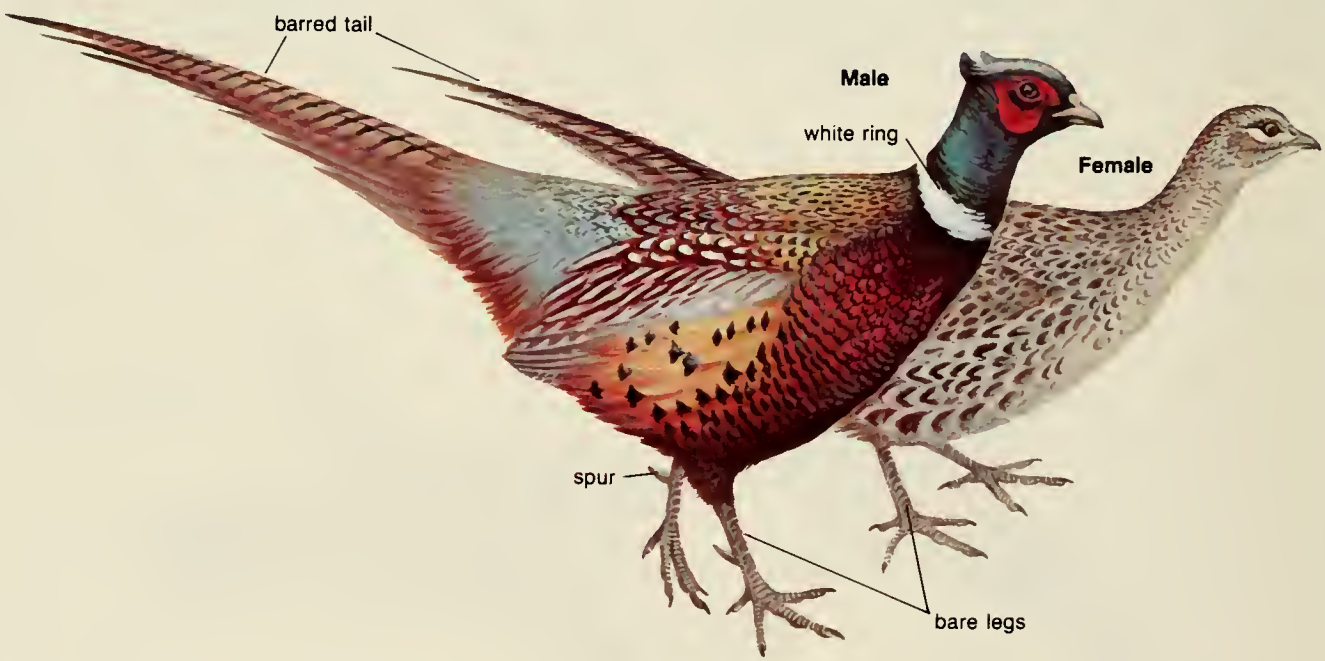
Dr. Philip L. Wright, University of Montana, Missoula, reviewed the paintings and text for accuracy.



RING-NECKED PHEASANT
(Phasianus colchicus)

OTHER NAMES: Chinese pheasant, chink, ringneck. **CHARACTERISTICS:** The adult male has a long, barred tail, iridescent coloration, white collar, and bright red face patch. The adult female also has a relatively long and strongly barred tail, but she has a dull mottled brown back and buff-colored breast. Adult males range from 30-36 inches in length and average 2.9 pounds in weight; adult females range from 21-25 inches in length and average 2.1 pounds in weight. **HABITAT:** Open grassland and cropland areas with brushy cover, especially along watercourses. **SIMILAR SPECIES:** Female or young sage grouse and sharp-tailed grouse can be confused with female pheasants or young pheasants of both sexes. But female sage grouse have a black belly patch and feathered legs, while female pheasants have a brown belly and bare legs. Sharp-tailed grouse have a much shorter tail, feathered legs, and white under parts. **STATUS:** Introduced to Montana prior to 1895. Fall hunting season, cocks only.

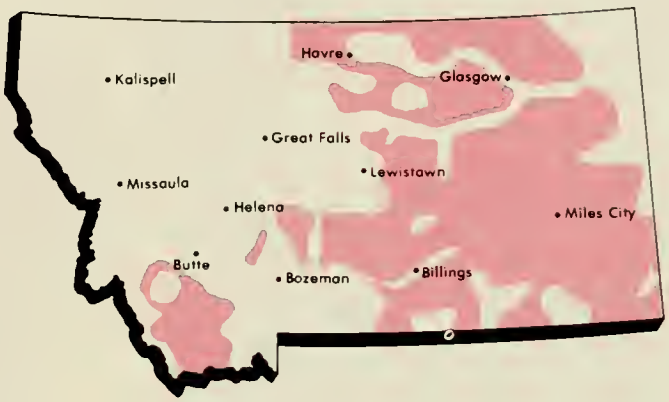


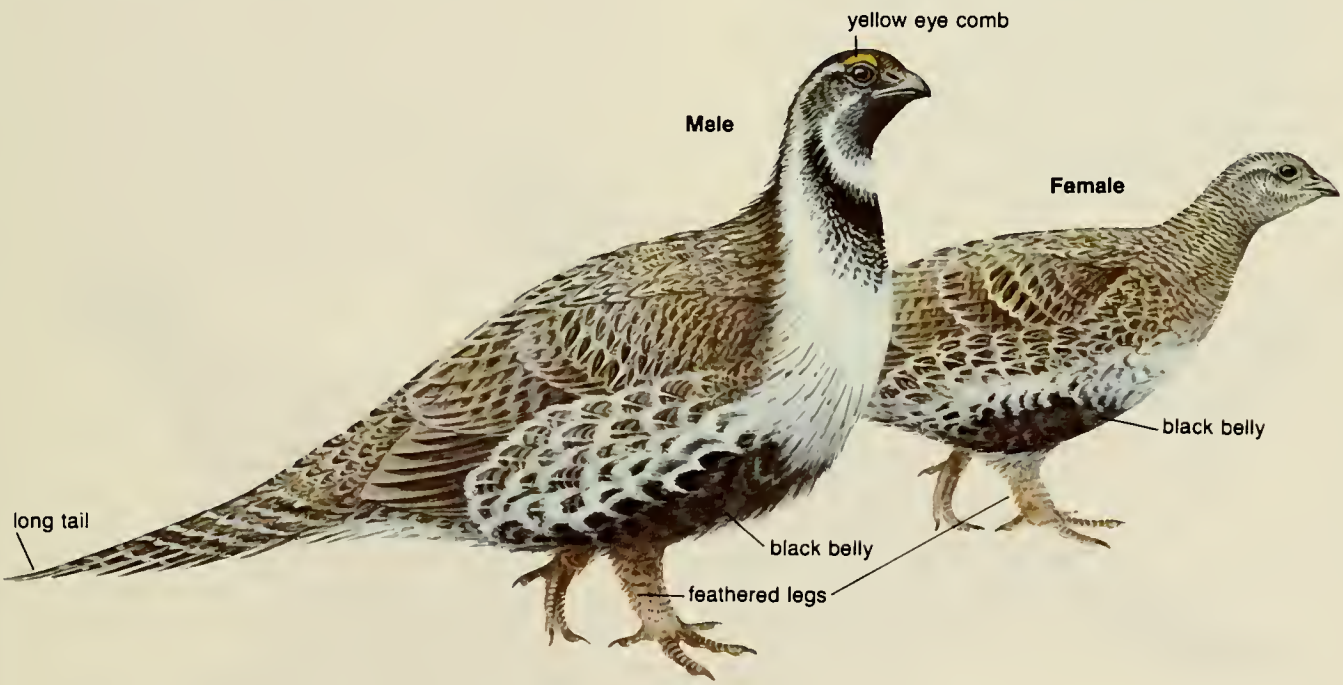


SAGE GROUSE

(Centrocercus urophasianus)

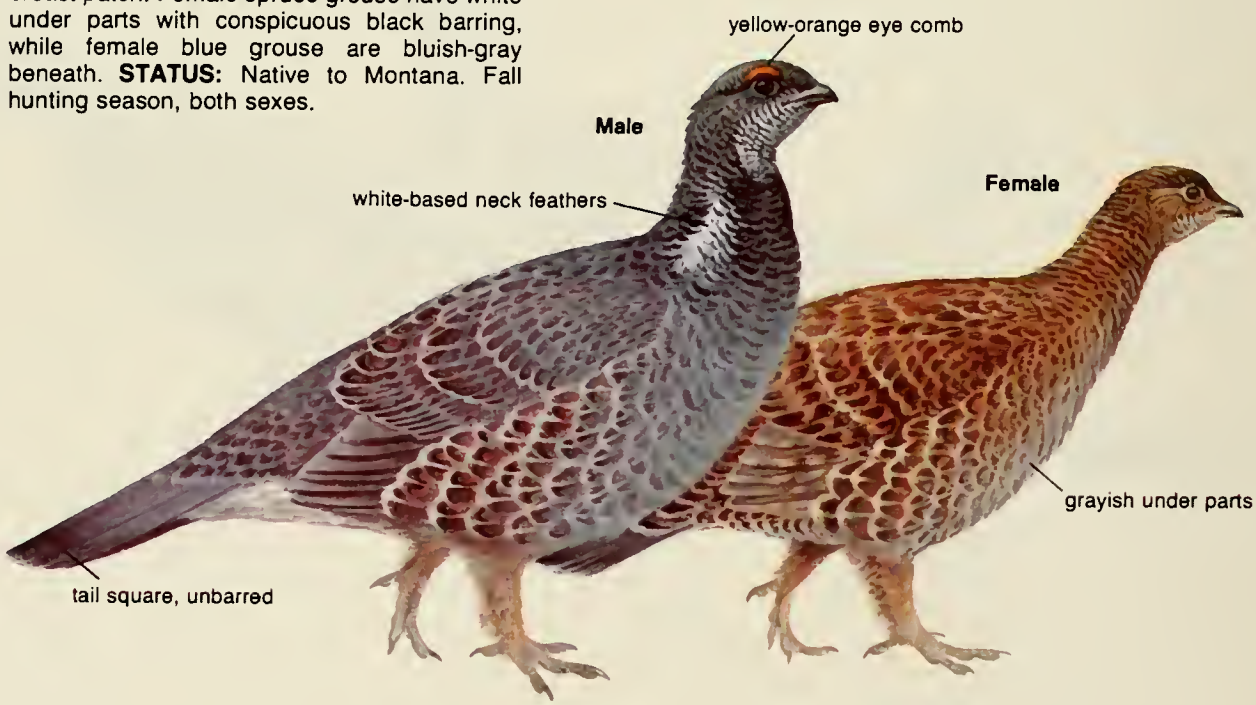
OTHER NAMES: Sage hen, sage cock, sage chicken. **CHARACTERISTICS:** The largest of Montana's grouse. Both sexes have relatively long, pointed tails, feathered legs, and mottled gray-brown, buff, and black plumage. Males have a blackish brown throat patch and an inconspicuous yellow eye comb. Both sexes have blackish bellies which contrast sharply with white under-wing coverts when the birds are in flight. Females appear to dip from side to side while flying. Adult males range from 26-30 inches in length and 4-7 lbs. in weight; adult females range from 19-23 inches in length and 2.5-3.5 lbs. in weight. **HABITAT:** Sagebrush. **SIMILAR SPECIES:** A female pheasant can possibly be confused with a female or young male sage grouse. Female pheasants, however, have a brown belly and bare legs, while female sage grouse have have a black belly patch and feathered legs. **STATUS:** Native to Montana. Fall hunting season, both sexes.



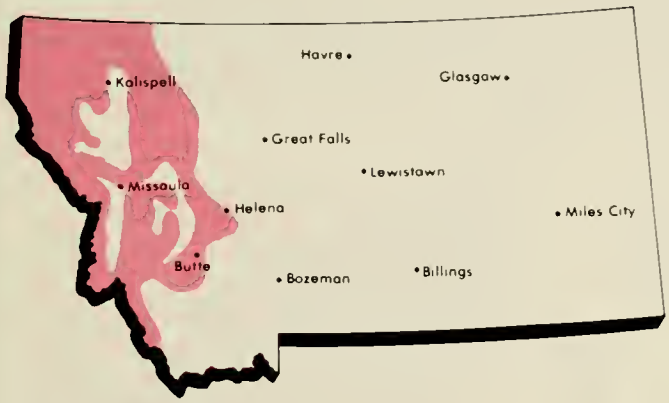


BLUE GROUSE
(Dendragapus obscurus)

OTHER NAMES: Sooty grouse, dusky grouse, fool hen, mountain grouse. **CHARACTERISTICS:** The blue grouse is the largest of Montana's three species of "mountain grouse." Both sexes have long, square tails which are unbarred. Males have slate-colored upper parts, white-based neck feathers around the air sacs, and yellow-orange eye combs. Females tend to be browner than males and have barring on the head, neck, and back. Both sexes have uniform blue-gray breasts and bellies, and feathered legs. Adult males range from 18.5-22.5 inches in length and 2.5-3 lbs. in weight; adult females range from 17-19 inches in length and average about 2 lbs. in weight. **HABITAT:** Blue grouse winter at high elevation in conifer stands. In early spring, they descend to lower altitudes, where they prefer forest edges and openings. Broods may be found quite far from timber during summer and early fall. **SIMILAR SPECIES:** Blue grouse are most likely to be confused with spruce (Franklin) grouse in Montana. Male spruce grouse, however, are considerably smaller than male blue grouse and have a black breast patch. Female spruce grouse have white under parts with conspicuous black barring, while female blue grouse are bluish-gray beneath. **STATUS:** Native to Montana. Fall hunting season, both sexes.



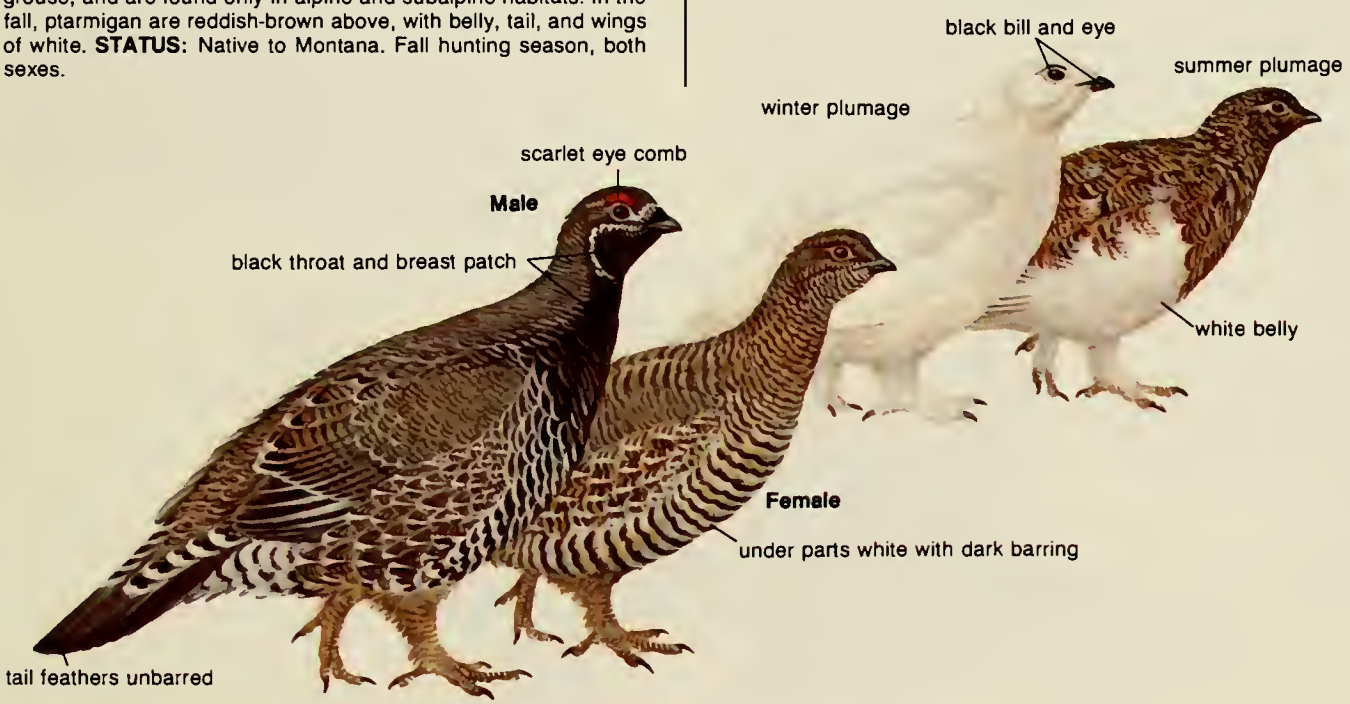
SPRUCE (FRANKLIN) GROUSE
(Canachites canadensis franklinii)



OTHER NAMES: Fool hen, mountain grouse, Canada grouse. **CHARACTERISTICS:** Both sexes have tail feathers that are unbarred and narrowly tipped with white, and feathered legs. Males are gray and black above, with a black throat and a well-defined black breast patch bordered with white-tipped feathers; they have scarlet eye combs. Females are mostly white beneath but barred with black, gray, and buff. Females are also extensively barred on the head. Adult males and females range from 15-17 inches in length and average about 17.5 ounces in weight. **HABITAT:** Spruce grouse in Montana inhabit dense forest types such as alpine fir, Engelmann spruce, or lodgepole pine. **SIMILAR SPECIES:** Although they are considerably smaller, spruce grouse are most likely to be confused with blue grouse. Male spruce grouse, however, have a black breast patch, while blue grouse do not. Female spruce grouse have white under parts with black barring, while female blue grouse have bluish-gray under parts. Ruffed grouse have distinctly banded tails, while spruce grouse have unbanded tails. White-tailed ptarmigan are smaller than spruce grouse, and are found only in alpine and subalpine habitats. In the fall, ptarmigan are reddish-brown above, with belly, tail, and wings of white. **STATUS:** Native to Montana. Fall hunting season, both sexes.

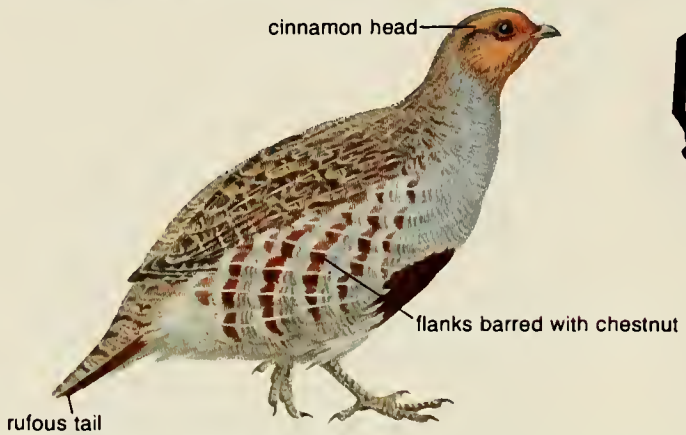
WHITE-TAILED PTARMIGAN
(Lagopus leucurus)

OTHER NAMES: Snow grouse. **CHARACTERISTICS:** Both sexes have white wings, belly, and tail in summer and are pure white in winter except for a black bill, black eyes, and black claws. In summer, males are mottled with black, buff, and white on the back; females are similar but have a more heavily spotted and lighter colored back. In autumn, both sexes are mostly reddish brown above, with brownish-black spotting. Adult males and females range from 12-13.5 inches in length, and average about 11.5 ounces in weight. **HABITAT:** Alpine and subalpine areas in a few of Montana's higher mountain ranges. **SIMILAR SPECIES:** None of Montana's upland birds closely resembles the white-tailed ptarmigan. The female spruce grouse, while it has white under parts with black barring, lacks the white abdomen, tail, and wings of the white-tailed ptarmigan. **STATUS:** Native to Montana. No hunting season.



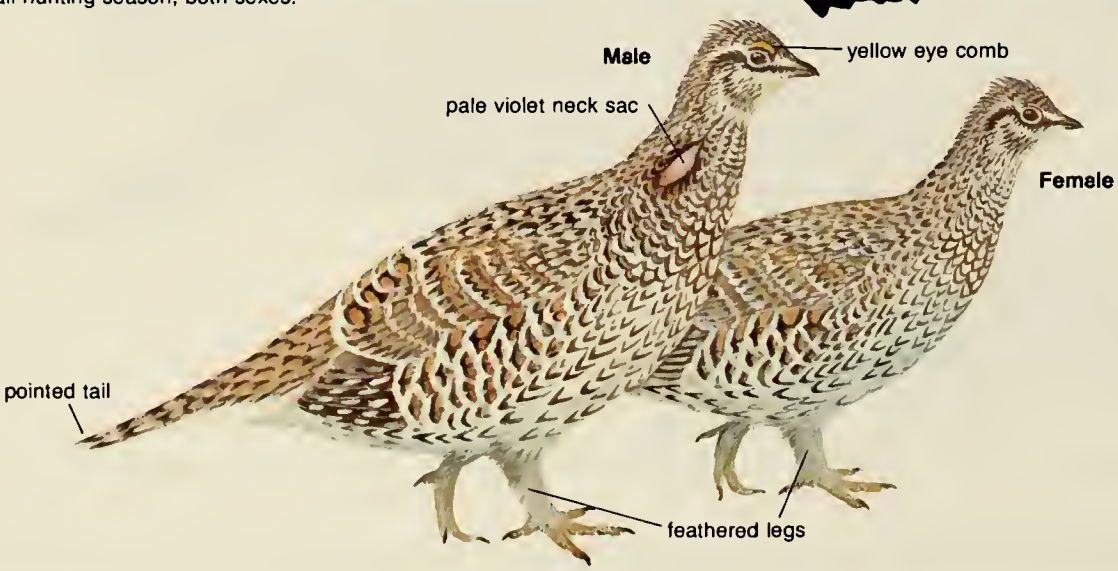
HUNGARIAN (GRAY) PARTRIDGE
(Perdix perdix)

OTHER NAMES: European partridge, Hun, Hunkie. **CHARACTERISTICS:** Sexes are similar in color. The adults have cinnamon-colored heads, gray sides with vertical chestnut bars, and grayish to brownish backs. The two central pairs of tail feathers are heavily barred, while the outer tail feathers are rusty brown. Both sexes may have a chestnut-brown horseshoe design on the breast, although it is more common in males. Hungarian partridge usually flush in coveys of 10 to 15 birds, and the rufous tail feathers are conspicuous on birds in flight. Adult males and females range from 12-13 inches in length, and average about 14 ounces in weight. **HABITAT:** Mixture of cultivated and noncultivated land; grasslands interspersed with wheat fields, weed patches, and brushy cover. **SIMILAR SPECIES:** Chukar partridge, which have a limited distribution in Montana, are somewhat larger than Huns; they also have red bills and feet, black bars on the sides, and a light throat bordered by a prominent black necklace. **STATUS:** Introduced. Fall hunting season, both sexes.



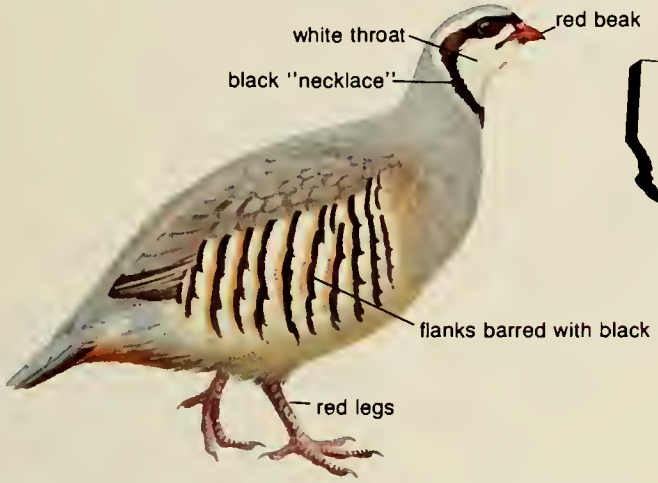
SHARP-TAILED GROUSE
(Pedioecetes phasianellus)

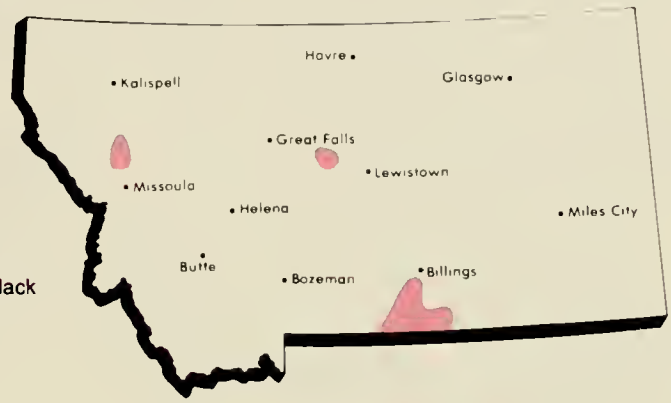
OTHER NAMES: Pintail grouse, sharptail, speckle-belly, prairie chicken, chicken. **CHARACTERISTICS:** Sexes are similar, although males have inconspicuous yellow eye combs and pale violet air sacs on the neck. Both sexes have feathered legs and upper parts mottled with white, buff, brown, and black. The wings have conspicuous white spots, and the breast and flanks have V-shaped brown markings on a snow-white background. Adult males and females average 16.5-18.5 inches in length; adult males average 33 ounces and adult females 29 ounces in weight. **HABITAT:** Primarily grassland interspersed with shrub- and brush-filled coulees. **SIMILAR SPECIES:** Female pheasants, especially early in the fall, can be confused with sharp-tailed grouse. Sharptails however, have much shorter tails, feathered legs, and white bellies (female pheasants are mottled brown throughout). **STATUS:** Native to Montana. Fall hunting season, both sexes.



CHUKAR PARTRIDGE
(Alectoris chukar)

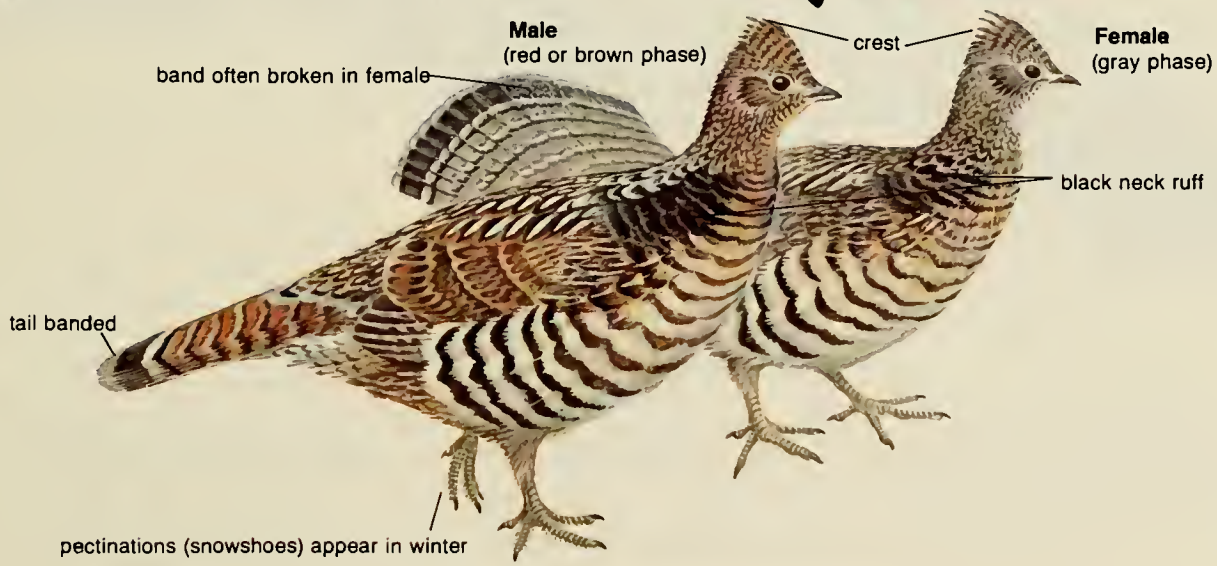
OTHER NAMES: Indian hill partridge, rock partridge. **CHARACTERISTICS:** Sexes are identical in appearance, with white cheeks and throat separated from the breast by a necklace of black. Adults are grayish brown to olive above, grading to gray on the chest. The sides are buff, with conspicuous black and chestnut vertical stripes, and the belly is buff. The outer tail feathers are reddish-brown. The bill, feet, and legs are red. Adult males and females range from 13-15 inches in length; adult males average 19.6 ounces in weight, and adult females, 15.7 ounces. **HABITAT:** Steep, rocky, semiarid country with an abundance of cheatgrass and brushy draws. **SIMILAR SPECIES:** Hungarian partridge are somewhat smaller than chukars, and have grayish-brown bodies with cinnamon-colored heads. **STATUS:** Introduced. Fall hunting season, both sexes.





RUFFED GROUSE
(Bonasa umbellus)

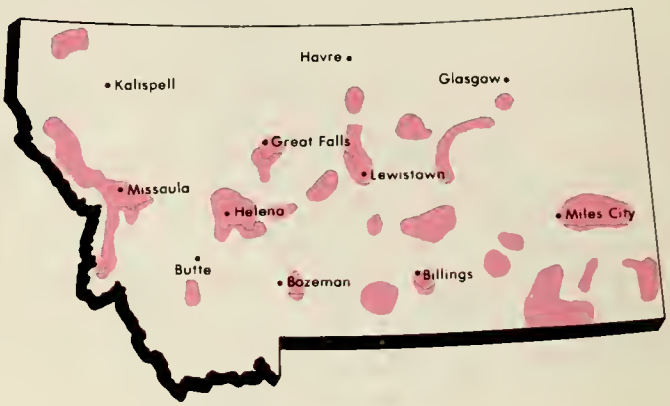
OTHER NAMES: Partridge, drummer, woods pheasant, willow grouse. **CHARACTERISTICS:** Sexes similar; the long, fan-shaped tail has a broad black band just below the tip (in females, the band is often broken in the central tail feathers). Both sexes have black neck ruffs (less conspicuous in females), crested heads, and brownish bodies. Males have a small orange-red eye comb. Feathering reaches about halfway down the legs; in winter, birds develop conspicuous fringes (pectinations) on the sides of their toes. Two color phases exist: red (or brown) and gray. Adult males and females range from 16-19 inches in length; adult males range from 21-23 ounces in weight, and females from 18-21 ounces. **HABITAT:** Dense, brushy mixed-conifer and deciduous tree cover, often along stream bottoms. **SIMILAR SPECIES:** No other grouse has the fan-shaped, distinctively banded tail and black ruff. **STATUS:** Native to Montana. Fall hunting season, both sexes.

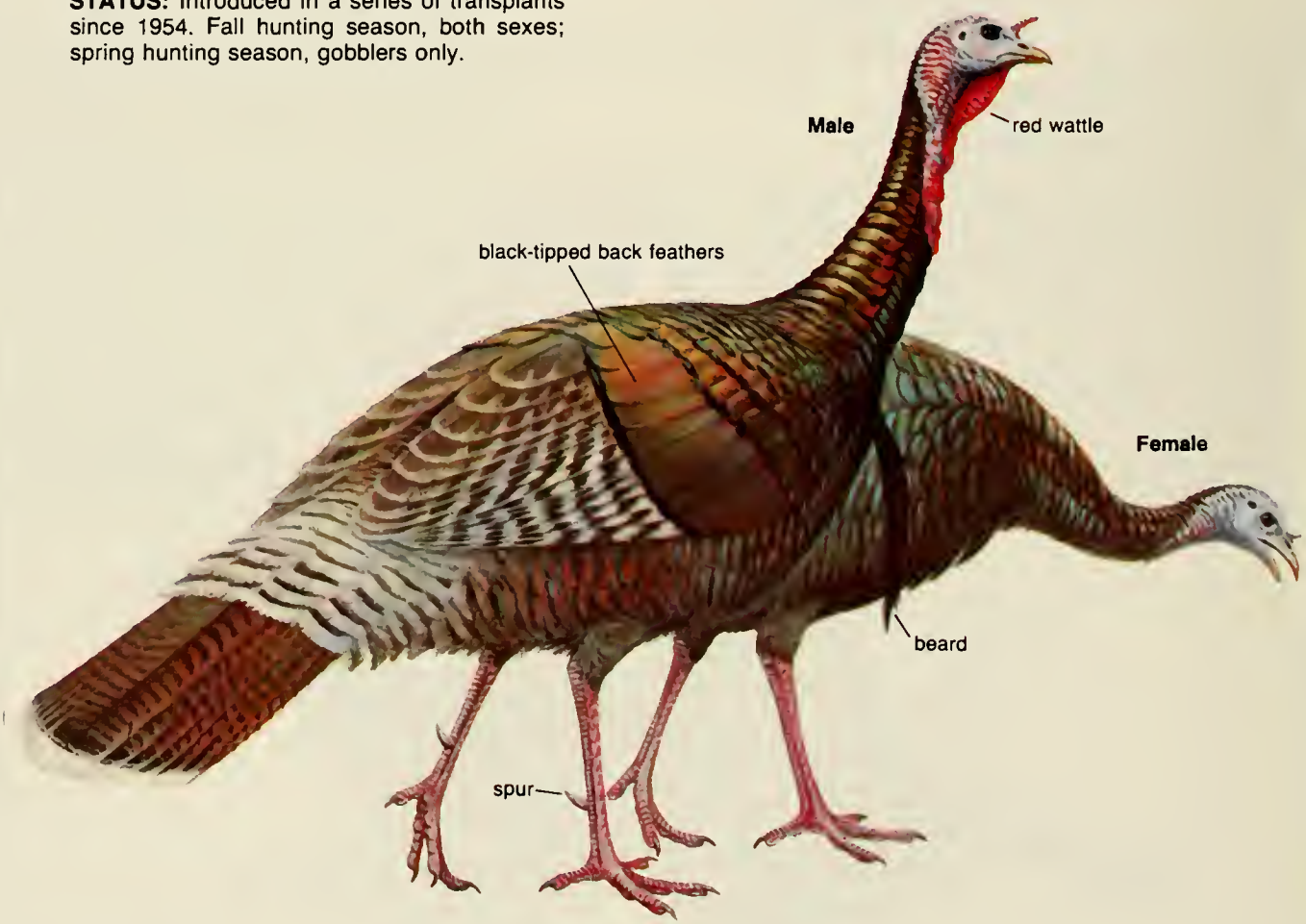


MERRIAM'S TURKEY

(Meleagris gallopavo merriami)

OTHER NAMES: Gobbler, tom, wild turkey. **CHARACTERISTICS:** The large size, iridescent bronze plumage, and naked bluish head should distinguish wild turkeys from all other birds. Males have a prominent red neck wattle, a beard, and spurs on their legs. Their back and breast feathers are tipped with black. Females are smaller, less brightly colored, and generally lack a beard (a few females have beards up to 3 inches in length). The back and breast feathers of females are tipped with yellowish brown or white. Adult males average 48 inches in length and 16.3 lbs. in weight, while adult females average 34 inches in length and 9.3 pounds in weight. **HABITAT:** Open ponderosa pine forest in rugged terrain, interspersed with grassland and brushy draws. **SIMILAR SPECIES:** None. **STATUS:** Introduced in a series of transplants since 1954. Fall hunting season, both sexes; spring hunting season, gobblers only.





Readers Respond

Registered Bluebirds

We stopped at Stop #24 on the Gravelly Range Tour south of Ennis, Mont., to register and what did we find in the registration box besides cards? Five little mountain bluebirds. Mama must have had some job getting in through the little hole on the bottom to build her nest and going in and out to feed her babies.

It was a hot day in late June, but the little birds didn't seem to mind. They never moved as we looked at them and took their picture.—*Ralph Deihl; Racine, Wis.*

Copying Wildlife Photos

I'm a beginning artist trying to get my break in the field. I was wondering if it is possible to get your permission to use your wildlife photos to copy and then sell the copies to people in my area. I would be more than happy to mention the name of your magazine on each piece of work I do.

As for the photos, I am speaking specifically of those wildlife photos in the Nov./Dec. 1981 issue of your wonderful magazine.—*Brian Kliewer; Rockland, Maine*

• *We can't give you permission to copy any photographs or artwork in* Montana Outdoors *because we hold only "first-time" copyright privileges. You would need to obtain permission from each individual photographer or artist whose work you wished to copy. There have been lawsuits as a result of copied work, especially when it was then offered for sale or displayed in competition. We would be happy to supply you with the addresses of any of our artists or photographers, and you can contact them directly.*—Ed.

Another Photo Issue Coming in January

Enclosed is my check for $5 for renewal of my *Montana Outdoors* subscription. I do love it, and the pictures are so very beautiful. Since I live in a lovely valley here and am able to see so much wildlife around me, I can doubly appreciate the effort that some photographers have spent to get their pictures.

I moved here from Wisconsin in 1946 and have never regretted the move. I think Montana has more glorious scenery than any other state and one can see so many kinds of animals and flowers and beautiful mountains, lakes, and forests.

Thank you for an outstanding magazine. This is my third year as a subscriber, and I only wish I had known about it sooner. Your Nov./Dec. 1981 issue was the very best of any magazine of its type I've ever seen.—*Mrs. Ila Nichols; Thompson Falls, Mont.*

• *You'll be pleased to know that we have another all-photo issue scheduled for Jan./Feb. 1983.*—Ed.

"Of Water, Weeds, And Man"

I enjoyed Paul Garrett's article, "Of Water, Weeds, and Man," in the July/August 1982 *Montana Outdoors*. I was reminded of the similar situation which exists at the very productive Henry's Lake fishery in Idaho. There, in many areas, emergent aquatic vegetation leaves only narrow lanes open by late summer and causes fishermen to lose a high percentage of fish hooked. The compensating factor is, of course, increased habitat for crustaceans, insects, fish, and waterfowl.

I had a little trouble with the picture caption "Big Hole Monster" on page 13 of the same issue. Were you referring to the fish, or possibly to my old friend Dick Oswald holding the fish?—*Dal Burkhalter; Bozeman, Mont.*

Seeing Double

If you are receiving more copies of *Montana Outdoors* than you should be, we would appreciate hearing about it. Call our toll-free number (1-800-247-5470) and report the multiple copies and the addresses to which they are going. Thank you for helping us streamline our mailing and subscriber lists.

"M" is for Mountains

A few months ago, my family visited Montana. Since I am a former resident, it was a very enjoyable homecoming. My wife and children were impressed beyond expression since they had never been there before.

A short while after returning, my wife handed the following to me. I would like to share it with the readers of *Montana Outdoors:*

M is for mountains, for that's what you'll see.
O is for open, a chance to be me.
N is for natural, everywhere you go.
T is for trees, more kinds than you know.
A is for ageless, a timeless beauty.
N is for neatness, it's everyone's duty.
A is for all of it put into one, and that's where we're heading to make our home.—*Steve Cooksey; Washington, Ill.*

Lonesome Nebraskan

I'm lonesome! Every time my issue of *Montana Outdoors* comes, I long for the day when my wife and I will be able to return to Montana and live forever. When I pastored a church congregation in Belgrade in the '70s, we began purchasing five acres of land east of Belgrade, just beneath Ross' Peak in the Bridgers, where we plan on building our retirement home.

Keep up the good work on *our* wonderful magazine. It may force me to quit here early and move back.—*The Rev. Lawrence R. Berge, Lake Forest Alliance Church; Omaha, Neb.*

Three Years Please!

It kind of makes me feel guilty to get such a fine magazine for that price. But it's best not to look a gift horse in the mouth. Three years please!—*John L. Finley; Arlee, Mont.*

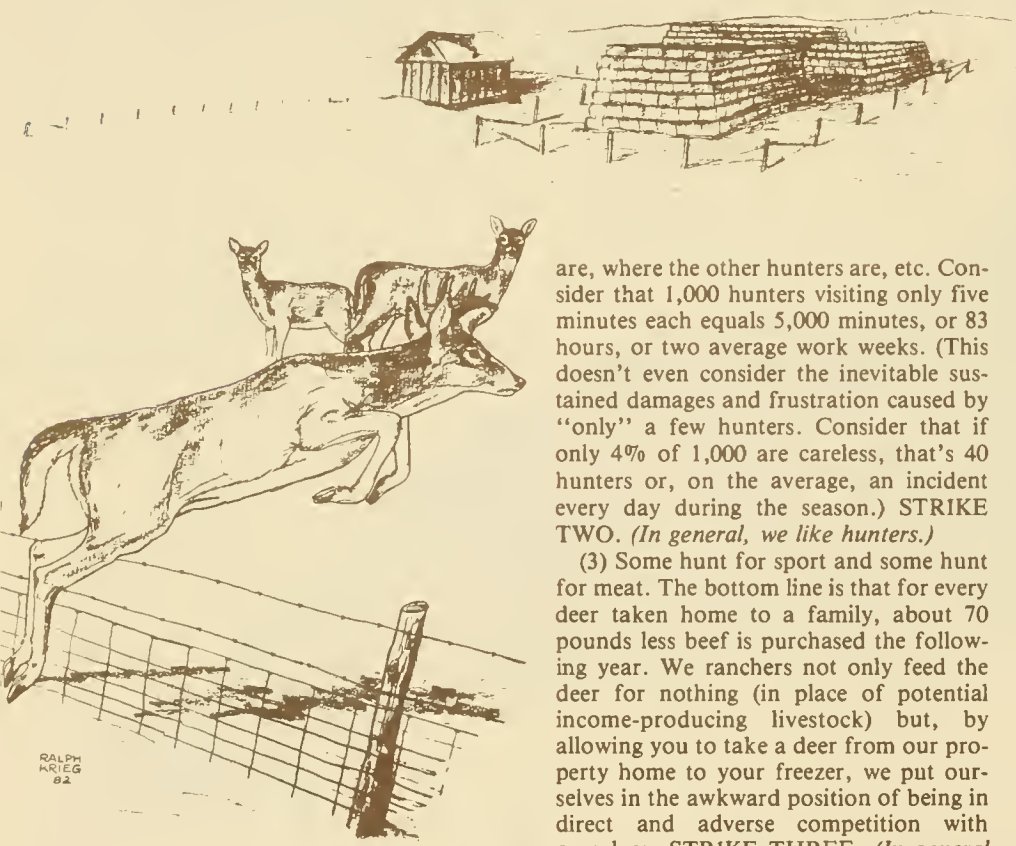
TWO RANCHERS' PERSPECTIVES

Dollars and Sense

• *With Montana's 1982 big game hunting seasons about to open, many sportsmen are thinking about their past failures and successes and wondering what this year might hold. One recurring theme—and one which the Department of Fish, Wildlife and Park recognizes and continues to emphasize—is landowner/sportsman relations. The following letter from a concerned landowner arrived recently at the main department office in Helena. We have omitted his name, but his remarks are appropriate and thought-provoking.*—Ed.

You make a living, somehow.

And so do we, somehow. Like everyone, inflation has driven our costs up 12% to 15% over the last year; in addition, the cattle market is down about 15% from last year.



We estimate a stable, year-round population of approximately 800 deer on our ranch (seasonally it varies from 500 to 1,500) and about 200 antelope.

Consider the following:

(1) Green or in the stack, deer like alfalfa hay, and they love sainfoin hay, not to mention oats, barley, wheat, and various other crops, including pasture grasses. It has been estimated that approximately five to eight deer eat as much forage as one cow—meaning that, theoretically, without any deer, we could run at least 100 more cows. STRIKE ONE. *(In general, we like deer.)*

(2) Beginning in September, and increasing through October and into November, we are besieged by phone calls and visits from prospective hunters hoping to find game and a place to hunt for it. During the past four years, we have averaged about 1,000—that's 1,000 hunter-days on our ranch. Understandably, most hunters call or stop by to ask where the deer are, where the closed areas are, where the other hunters are, etc. Consider that 1,000 hunters visiting only five minutes each equals 5,000 minutes, or 83 hours, or two average work weeks. (This doesn't even consider the inevitable sustained damages and frustration caused by "only" a few hunters. Consider that if only 4% of 1,000 are careless, that's 40 hunters or, on the average, an incident every day during the season.) STRIKE TWO. *(In general, we like hunters.)*

(3) Some hunt for sport and some hunt for meat. The bottom line is that for every deer taken home to a family, about 70 pounds less beef is purchased the following year. We ranchers not only feed the deer for nothing (in place of potential income-producing livestock) but, by allowing you to take a deer from our property home to your freezer, we put ourselves in the awkward position of being in direct and adverse competition with ourselves. STRIKE THREE. *(In general we* love *beef.)*

Therefore, this year we are going to ask you to do three things in exchange for the privilege of hunting on our ranch:

(1) Try hard to take a deer or antelope off our range (any age or sex will do, consistent with the law).

(2) Abide by our rules and signs.

(3) Seriously consider purchasing an additional 70 pounds of beef from your grocer during the next year for each big game animal you take home this season.

We're not charging you to hunt.

We're not asking for a big profit.

We're just hoping to come a little closer to breaking even in this deer/hunter/beef dilemma.

Good luck, and enjoy yourselves.

Food for Thought

• *Bob Boyd ranches near Wilsall, Mont. He wrote "Food for Thought" during the long, difficult winter of 1978-79.*—Ed.

They came like dark grey ghosts from the deeper darkness of the small creek valley. Single file through the belly-deep snow, they seemed to move without volition on the surface that scintillated like a thousand tiny lights reflecting the high-riding sliver of moon.

Up the short, steep trail to the four-foot fence of woven and barbed wire they came.

It was there the legs became apparent. One by one, effortlessly to my eyes, they leaped the wire, then moved faster to the stacks of baled hay.

From my hiding place in the ancient wooden granary nearby, I counted them as they leaped. Nineteen! Watching them scatter out to the three different stacks, I almost missed some others that appeared at the fence. I counted them. Thirty-nine in all had come out of the brush along the river, across the frozen creek, and into the stack yard.

They were all whitetails, and I wondered why no mule deer had come. At other places, I'd seen them graze or raid haystacks together many times.

It was not their first foray into my not-too-plentiful supply of winter feed for our livestock. But it was the first time I had bundled up against the extreme cold, gone out to hide in the granary to watch them, and had taken along a 35mm camera with a flash attachment.

It was midwinter in this high mountain valley of Montana. The whiteness lay deep over the wide land. All grass, weeds, and forbs were covered by the heavy blanket of crusted snow.

The mule deer had come down from their higher summer range weeks ago, driven out by scarcity of natural feed and also by the crusted surface that made travel dangerously difficult for them, but not for the soft, padded feet of the predatory coyote, lynx, and mountain lion. Along the mesas and slopes of the foothills, the sage grew three feet tall; while mule deer will eat the stuff, it is, really, a starvation diet.

Whitetails prefer to remain in the thickets along the streams. The more junglelike it is, the better. But just as their larger, less wary relatives, the "muleys,"

they come out into grain fields and meadows in the darkness of night. But now, the small willows, alders, currants, etc. were eaten down to the crusted snow, and they all were facing death. So tonight they were raiding someone's haystacks.

When spring finally comes and the land once more begins greening up, we who ride the range would find the pitiful remains of many that did not survive.

All this ran through my mind while I sat in the frigid lookout watching the hungry creatures nibbling at the sweet, cured hay.

There were three stacks in the yard, one of mixed grass, one of "hay barley" cut green, and the larger one of alfalfa. They sampled it all, but nearly always returned to the alfalfa.

No more deer appeared from "out yonder," and I was becoming chilled, so I moved slowly to the small open window and prepared to start shooting, hoping the shutter would work in the cold. It did. At the brief flash, a few of the animals nearest me perked up. Most paid no heed; even when I slipped quietly out into plain view, not all of them fled. They all would be back before I reached the warmth of the ranch house.

Just before going inside, I turned my flashlight on the thermometer fastened to the wall. Thirty-one degrees below zero.

As the winter dragged on, the stacks grew smaller for the cows; the horses and the sheep had to survive on what I gave them until that far-off time when spring and green feed would return to this frozen land.

I would have to buy more hay before then—and it was dear—and while I have never felt there was much philanthropy in my make-up, I was (can you believe it) glad the poor creatures had found my store of hay.

Long ago, when I was a young and widely roving cowhand, I had been very cold and desperately hungry.

Have you ever been hungry?

Two Treasures of Treasure County *continued*

stead in this arid region would not support a family. In examining some of Cole's old photos of the family homestead and the surrounding country, one of the first things that caught my eye was the scarcity of trees and wildlife habitat. The "good old days" were a little short on these items, especially when compared with what we have today.

Miller and Cole agree that noticeable changes in wildlife diversity and numbers occurred after many of the homesteaders had moved on. Changes in farming practices, development of an irrigation system in the Hysham valley, and changes in national and state conservation legislation promoted wildlife and habitat management programs.

Both Cole and Miller were instrumental in founding the Forsyth Rod and Gun Club (now the Rosebud-Treasure Wildlife Association) in 1934. During their 48 years of association with the group, both have served as president and currently serve on the board of directors of the 150-member club. When I asked the two charter members what the club's greatest accomplishments were, both agreed the club played a key role in promoting good rancher-sportsman relations and supporting the activities of the Department of Fish, Wildlife and Parks. I would have cast my vote the same way. It was the sportsman club-wildlife agency alliance that gave the fish and wildlife profession its start. That alliance enabled the American system of wildlife management and conservation to achieve the best record of any in the world. It was built by concerned sportsmen and wildlife professionals who struggled toward mutual goals. It was sportsmen such as Cole and Miller who blazed through political thickets and fought for legislation that brought about solutions to the embarrassing exploitation of the wildlife resource. This is part of our heritage we should never forget.

Several years ago, I wrote an editorial, "The Passing of a Tradition." The piece focused on the bottoming-out of rod and gun clubs in Montana and the faltering interest of hunters and fishermen in such activities. I hammered away at the Rosebud-Treasure Wildlife Association as one of my examples after learning the club was switching from monthly to quarterly meetings. The article had one positive impact. It raised the hackles on Cole's and Miller's necks. "I was madder than the dickens when I read that," said Miller. "But you were right!" At the next meeting, the club voted to go back to monthly meetings.

As the two saplings took root in Treasure County, their interest and dedication to wildlife also grew firm. In 1968, Miller became president of the Montana Wildlife Federation, a job he held for two years. Miller's concerns were well-expressed in the "President's Report" in the June 1969 issue of the "Montana Wildlife Federation News." He wrote: "I have attended a lot of conventions over the past year and talked to many organizations, but probably one of the richest and most rewarding days of all was experienced on a Conservation Tour with our young people of Treasure County. These youngsters were attentive, courteous, and well-behaved—a tribute to their teachers and parents.

"I have no qualms at all in leaving the future destiny of our country in hands such as these. But believe me, I was deeply ashamed when they asked why was this situation allowed to come about in the first place? Pollution, filth, land erosion, and overall disgraceful management of our natural resources. A good question and one hard to answer to their satisfaction. I guess we adults were tried in the balance that day and found wanting. Would that all men who exploit our environment and natural resources with no regard to the future could gaze into the clear eyes of a child and truthfully have to answer that question. May God forgive us for the almost insurmountable task we are handing them in cleaning up the mess we created."

Because of his dedicated efforts with the federation, Miller was awarded the Conservation Communication Award by the Sears-Roebuck Foundation for "...outstanding contributions to the wise use and management of the nation's natural resources."

As a public speaker, Miller can be quite eloquent in expressing his thoughts, especially when it comes to "Fish 'n' Game" matters. During the 1981 Montana legislative session, Miller traveled to Helena to testify at a Senate committee hearing on a DFWP license fee increase bill. When Miller finished comparing the "good old days" with what we have now in terms of wildlife and hunting opportunities, everyone in the packed hearing room stood up and gave him a rousing round of applause. There was no doubt in anybody's mind that Miller had made a positive impression about the importance of those license dollars.

Like Miller, Cole has made sure that no grass grew under his feet. In 1976, he was awarded a "Landowner of the Year" award by the DFWP for his "contribution to understanding and cooperation between landowners and sportsmen in Montana."

One can't dispute the fact of Cole's empathy for sportsmen. "I don't like 'No Hunting' signs," he admits. "I put up 'Hunting with Permission' signs and I haven't had any real problems with those who ask permission. In fact, they've been pretty good to me. One time some Billings hunters left a package on the front porch for me. I went out to get it and there was a dressed-out goose with a bottle of Prairie Times stuffed inside. I asked them later how they shot the goose without breaking the bottle and one fellow said, 'Why, we shot that goose in the head!' "

One of the bright spots for Cole is the annual Rosebud-Treasure Wildlife Asso-

ciation's fish fry conducted at his ranch. Each year in August, club members gather on the banks of the Yellowstone to picnic and engage in activities ranging from archery shoots to log-sawing contests.

"The fish fry is one of the good things the club does," boasts Cole. "It gets the landowners, sportsmen, and 'Fish 'n' Game' people together to talk and exchange ideas. A friend of mine who came down last year said to me, 'Norris, people talked to me at the fish fry who wouldn't talk to me otherwise. We'd sit down in the timber and visit about things that needed talking about.' "

In terms of friendship, one would have to cover a lot of territory to find a bond stronger than the two share. "We've had a wonderful relationship for 70 years," says Miller. "The only point of dissension we've ever had was during an antelope hunt." Cole, who loves to tell a story, related how the two went hunting in the badlands country north of Hysham years ago and spotted a bunch of antelope coming in toward a reservoir. "We left our pickup out of sight, and walked quite a ways. Then we crawled up this ridge. We looked up now and then, and the antelope kept getting closer and closer. We got nearly to the top of the ridge and Harold crawled up to some sagebrush and there was this big rattlesnake. I jumped up and yelled, 'Look out Harold! There's a rattlesnake!' And of course that scared the antelope. Even though Harold didn't get bit by that snake, he sure was mad at me for scaring those antelope!"

Canada geese hold a special spot in the hearts of the two ranchers. When geese are mentioned, their eyes light up with old dreams and doings. And if the hour is early or late, and the company convivial, they will soar off in long rambling anecdotes that are special, and worth sleeping on.

When I visited the two last March, geese were trading up and down the river and a small flock was feeding a stone's throw away in one of Cole's fields.

"I never saw so many geese in the valley before," said Cole. "If we shot a goose in the old days, that was an oddity. The first goose I ever killed—I was so excited—I put it in the car and started up to Harold's place. I passed him on the road and when we finally stopped and got together, I found out he had also shot his first goose and he was coming over to my place to show it to me!"

There's no doubt that geese have increased dramatically in recent years and the increase represents one of wildlife management's greatest success stories in the Yellowstone basin and elsewhere in this nation. In 1956, an aerial census on the Yellowstone River between Miles City and the town of Bighorn yielded an estimated 26 breeding pairs. An aerial census of that same stretch in 1978 produced an estimated population of 187 breeding pairs; in 1982, an estimated 197 breeding pairs nested in this reach of the river. The remarkable advances in Canada goose numbers can be mostly attributed to changes in agricultural practices in the Yellowstone valley. Geese have adapted readily to the intensive production of wheat and corn which provides waste grain after harvest. The two waterfowl hunters are also quick to point out that the cornerstone of the goose management program centers on the island nesting habitat provided by a free-flowing Yellowstone.

When asked how they felt about the waterfowl closure on the Yellowstone River between the mouth of the Bighorn River and the Rosebud-Custer counties line enacted in 1976, both agree it is time to sit down and re-evaluate the closure. Because of the dramatic increase in waterfowl numbers, they believe the river should be opened to hunting under a controlled management plan.

There's no doubt that Cole and Miller have strong feelings about the Yellowstone River, and rightly so. It's a river where they unlimbered their coltish limbs—a river they fished in, boated on, hunted around, and swam in.

One has to admit there's a lot of river there. Stand on the banks of the Yellowstone by Cole's place. Look left and right and you can see a twisting ribbon of water laced with islands. A river dissecting the countryside and lifting in great swells to the open horizon. Listen hard. You'll hear water gurgling as the river slides by and, if you're lucky, the bark of geese. It's a place you can take your soul for a long, feasting look—a place where the river experience can seep into your memory to stay warm, and handy, and comforting. For me, the magic never fails.

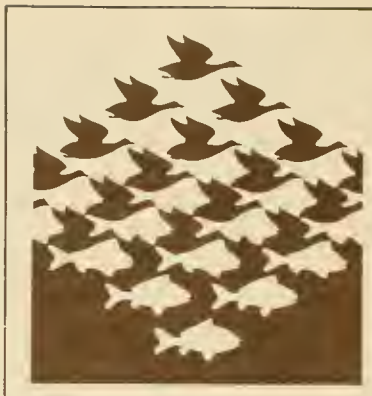
It was the Rosebud-Treasure Wildlife Association, guided by members like Miller and Cole, that took a firm stand and supported the DFWP's request for an instream flow reservation. Because of its support, and the support of others, the Yellowstone will not follow the direction of other major American rivers that have succumbed to unrestricted alterations and depletions. Cole and Miller were quite vocal in the mid-70s when it came to a proposed commercial cottonwood clear-cutting operation that threatened Yellowstone River bottomlands in the Hysham-Forsyth area. Fortunately, the logging operation never materialized because of a poor economic climate.

Along with their strong feelings on a free-flowing Yellowstone, both adamantly supported Sen. Dave Manning's (D-Hysham) water use bill, passed by the last Montana Legislature without a single dissenting vote. Manning's plan calls for drawing off excessive flood water, confining it in buried conduits, delivering it by gravity feed into off-stream storage areas, and releasing it on a controlled basis through turbines back into the streams.

It's said by some that truly good people who you respect and admire are few and far between. I believe this is true. In the case of Harold Miller and Norris Cole, there's more than just a warm personality and a firm handshake. As with many things in life, a plain exterior often conceals hidden riches.

The Sarpy Creek country has produced two of Montana's finest examples of work horses who were strident forces in promoting a better system of wildlife conservation. It was Cole and Miller, and thousands like them across the nation, who blazed trails through thorny thickets and enforced their demands on those who so lavishly exploited our resources. It was Cole and Miller, and many like them, who pitched in to work, while others sat around quarreling and grumbling that nothing could be done.

Who's going to fill their shoes when they're gone? That's a question that bothers me. ■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September 25, 1982

The Hungarian partridge is Montana's smallest upland game bird; adults of both sexes weigh from 13 to 16 ounces (photo: Jon Cates).

Montana's Cosmopolitan Game Bird

by Dr. John P. Weigand

• *This article is a synopsis of research conducted for the Department of Fish, Wildlife and Parks and the information contained in the author's wildlife monograph, "Ecology of the Hungarian Partridge in North Central Montana." The monograph won The Wildlife Society's 1982 Publication Award for a Monograph (see "The Catchall")*—Ed.

The Hungarian partridge is probably the most cosmopolitan upland game bird in Montana. It is distributed more widely than eight other upland species and inhabits a variety of terrain, from cultivated lowland valleys to sagebrush-covered plains, to grassy mountain foothills. The Hungarian partridge has evolved a very close relationship with man and his use of the land.

Partridge have persisted on Montana farm and range lands, even during the 30-year decline of the popular ring-necked pheasant. While annual harvests of partridge since 1958 have generally ranked behind those of pheasants and sharp-tailed grouse, they were No. 1 in Montana in 1977. The average annual harvest for the past 24 years is 68,100 partridge, ranging from a low of 29,900 in 1981 to a high of 163,800 in 1964 (see Table 1). The low harvest for 1981 was possibly because of a reduced hunting effort, due to the publicity about endrin.

The whys and wherefores surrounding this seemingly incidental species became the subject of an intensive five-year department research effort on a 54-square-mile study area north of Choteau, in Teton County, from 1969 to 1974. The site was chosen because it contained three different land uses: ranching and haying, cultivation of grain crops, and a mixture of those two uses. Because private landowners cooperated, the study was successfully completed.

Objectives included: to determine (1) the population characteristics of partridge on the study area, and (2) the seasonal ecological requirements of partridge in relation to agricultural land use and management.

HISTORY

Hungarian partridge (*Perdix perdix)* are native to central Europe. Their origin probably gave rise to their common names in this country,

*The study from which this article was developed was supported by Pittman-Robertson funds, Project W-120-R.

"Hungarian partridge" or "Huns," although in Europe they are called "gray partridge."

The most successful partridge release in North America occurred from 1908 through 1911 near Calgary, Alberta. After release, birds from that area spread out during the following decade at a rate of about 28 miles per year. At that rate, Huns could have crossed Montana's northern border by 1914.

Coincidentally, the Montana Fish and Game Commission first considered adding Huns to the state's list of game birds in 1914. By 1922, Huns were reported in the Sweetgrass Hills just south of the Canadian border, along the Milk River, and as far south as the Marias River (38 miles from the border).

The Fish and Game Commission began importing adult partridge from Czechoslovakia and Hungary and releasing them throughout Montana in late spring of 1922. Approximately 7,600 birds were transplanted into at least 45 of 54 existing counties from 1922 to 1926. Establishment of partridge in Montana was probably hastened by releases in North Dakota and Wyoming in 1923.

By 1927, Teton County residents were complaining that Huns were depredating crops. So the Fish and Game Commission obtained legislative authority to allow partridge hunting and the first season was conducted Nov. 24-28, 1929.

Partridge can survive most Montana winters. If snow remains penetrable, it provides good insulation for feeding and roosting birds (photo: Jon Cates).

IDENTIFICATION

Hungarian partridge are Montana's smallest upland game bird. Adults weigh from 14 to 16 ounces, with both sexes about the same size. Juveniles (birds of the year) are more than 75% grown by their eighth week and have reached adult size by 14 weeks. In an average year, most juveniles are more than three-fourths grown when the hunting season opens in early September.

Partridge are rather chunky birds, slate gray or bluish-brownish-gray in color, with stubby wings. Their short, rust-colored tail feathers are fanned and readily seen when the birds are flying. They often chatter raucously when flushed and are known for their low-altitude flights.

While males and females appear to have identical coloration, there are distinct color differences. Males have rust-colored throat and cheek patches; the same areas on females are much lighter, buffy or yellow-tan. Another secondary sex characteristic is the buff-colored cross-barring on the "elbow" coverts (feathers) on the wings of females, and the lack of such barring on males. Females also have more colored barring on their backs than males which serves as added camouflage for hens on nests.

Adult birds can be distinguished from juveniles in the fall and winter by examining the sequence of replacing (molting) the outer two flight feathers on the wings, their degree of pointedness (usually juveniles) or roundness (adults), and their coloration. Hunters can obtain a fairly good idea of partridge age by the color of the feet and scaly part of the legs; juveniles have yellow legs and feet, while those of adults are gray or bluish-gray.

FEEDING AND FOOD HABITS

Huns have two major feeding periods each day: between sunrise and two to three hours after sunrise, and the last hour before sunset. This pattern is more difficult to observe in winter because the birds may feed all day except for one or two hours at midday.

On the Teton County study area, waste grain was the most common food item for Huns. It was eaten whenever available, and was taken by chicks as well as adults. Wheat (spring and winter varieties) was the most frequently eaten grain in this area, although barley and domestic and wild oats were also consumed.

Forbs, or broad-leaved plants, were eaten in much smaller amounts each season, but may have been under-represented in food habits analyses; forb seeds are much smaller than grain and therefore provide less volume. (If frequency were considered, forbs would increase in importance in the diet.) Hun research in Great Britain has shown that knotweed (a forb) is higher in some nutrients (calcium, magnesium, and nitrogen) than grain and these seeds may be necessary for a balanced partridge diet. Knotweed seeds are also eaten by Montana's partridge.

While some insects and other animal matter are eaten when available each season by adult partridge, these items are usually taken in small quantities. However, *insects are critical* for partridge chicks, especially during their first three weeks. (Animal matter high in protein is necessary for many other bird species as well.) Research in Great Britain showed that 95% of the diet of chicks for their first week was insects, 91% during the second week, and 52% during the third week. Without insects, chicks cannot survive the early post-hatching period.

Table 1—Annual Harvests of Hungarian Partridge in Montana, 1958-81

Year	Harvest	Year	Harvest	Year	Harvest
1958	77,000	1966	123,500	1974	45,200
1959	41,900	1967	70,600	1975	53,200
1960	49,400	1968	70,200	1976	103,900
1961	37,500	1969	69,100	1977	103,900
1962	45,300	1970	49,600	1978	93,000
1963	111,500	1971	36,700	1979	62,600
1964	163,800	1972	32,600	1980	46,400
1965	40,500	1973	40,600	1981	29,900

Table 2—Percent Composition of Land Uses for Seasonally Optimum Hungarian Partridge Habitats in North Central Montana

Cover Type	Spring	Summer	Fall	Winter
Agriculturally Idle	6	5	3	5
Grain	39	34	50	33
Fallow	20	23	27	27
Hay	7	11	3	5
Range	25	24	15	28
Miscellaneous	3	3	2	2

SOCIAL ORGANIZATION AND BEHAVIOR

Partridge are extremely social. Ninety-eight percent of the 17,736 partridge viewed during the five years on the study area were in groups of two of more birds. Single birds are usually seen during the nesting season; most of those birds are males, and are probably mates of hens nesting nearby.

Winter groups (coveys) begin disbanding in early February, coinciding with the beginning of courtship and pairing. Courtship in partridge is low-key compared with the elaborate displays of pheasants, grouse, and turkeys. Males simply stand or strut around, emitting guttural croaks, while females walk around them with seemingly little interest. Eventually, each female selects a male, the male recognizes her as a partner, and the pair bond is formed. Both males and females guard their partners against intruders. Battles involving a female guarding her male against other females were the most furious of the defense encounters observed. Pairing is usually completed by March 1.

Limited evidence at the study site suggests that pairs of adults surviving through winter remain paired for another year. Those observations also suggested life-time pairing. Findings from marked birds indicate that adults without surviving mates probably select other adults as new mates. Such pairing can occur between males and females in the same covey, or it can include other coveys. However, juveniles most often pair with juveniles of other coveys. While all partridge look alike to us, they apparently recognize one another and the social or family status. The obvious benefit of such recognition is that it minimizes inbreeding.

Every female secures a male partner in the spring. However, males are not as fortunate—there are about 125 males per 100 females, and unpaired males have two options if they are to survive: (1) to become accepted by a pair as an accessory male (an accessory male is one which the pair permits to live close to it; he does not participate in breeding or nesting, or (2) to group together with other unpaired males as a flock of bachelors. Both attachments occurred on the study area; the largest bachelor flock contained nine males.

Nesting begins as early as mid-April, with the peak of nest starts in mid-May; 75% of the nests are started by early June. Clutches average about 15 eggs and seem to be incubated only by females. Hatching begins about June 1, with the peak during the third and fourth weeks of June.

Partridge will renest if a nest is destroyed or abandoned early in the nesting cycle. By summer's end, an average of two-thirds of the hens will have nested successfully.

Families are formed when the eggs hatch. Each new family consists of the male and female (assuming both survive), the chicks, and an accessory male if there is one. Families maintain their bond throughout the summer, and there is very little mixing of broods.

Pairs unsuccessful in hatching a brood may remain as a separate unit, band together into small coveys, or be accepted into other family units. Accessory males follow the lead of their adopted pair.

In winter, coveys actively defend their territories against intrusion by other coveys. What might appear to be a covey of 50 or more birds in winter are actually independent coveys near each other. The coveys may mix when the birds flush, but they rejoin their original coveys shortly after landing. These traits suggest that families remain together through fall and winter.

MORTALITY

About 74% of partridge populations die every year. Most of the annual loss can be attributed to predation, especially by hawks. No partridge observed on the study area lived longer than four years.

Between winter and spring on the study area, 77% to 79% of the Huns died. Several factors contribute to those losses: Old vegetation is matted down and offers little hiding cover in early spring; more secure cover is claimed and defended by adults; almost three-fourths of spring populations are last year's young that are inexperienced at selecting good, secure cover, and raptors (birds of prey) are migrating back to Montana from their southern wintering areas.

Weather conditions in spring set the stage for a partridge population to increase or decrease. A dry spring results in early nesting and above-average production, so the population increases. Above-average precipitation during April delays nesting and will somewhat reduce overall

A five-year department research effort indicated that Hun harvest by hunters was insignificant—only about 3% of each year's partridge mortality (DFWP photo: Dr. John P. Weigand).

production. However, heavy rainfall during nesting and during the three weeks after hatching precludes any reasonable chance for production that year.

Another major mortality occurs after chicks hatch. An average of 45% of a year's production is lost between mid-June and the end of September.

Hunting accounted for only 15 of 484 banded Huns—or about 3% of each year's partridge mortality! Even though Great Falls, Montana's second largest city, is only 70 miles from this study area, harvests by hunters were insignificant. This suggests that partridge populations in Montana are grossly underutilized; they could endure annual harvests 10 times this level. Although achieving such a harvest level is probably unrealistic, the Fish and Game Commission could increase the daily bag to eight to 10 birds, increase possession limits to four to five times the daily bag, and lengthen the hunting season in some areas. Such actions should generate additional hunting of partridge.

Partridge can survive most Montana winters with little abnormal mortality. Snow, especially if it remains penetrable, provides good insulation for feeding and roosting birds. While partridge do not burrow into snow often, a surface layer of ice on snow can prevent the birds from scratching down to food or entomb entire coveys.

MOVEMENTS

Partridge on the study area tended to be "homebodies," restricting their movements to relatively small areas. Observation of 320 marked birds indicated that 86% spent their entire lives in three-eighths of a square mile! Females didn't move as far as males. Four radio-instrumented females ranged over four to 49 acres from February to mid-April, the period of pairing and initial searching for nest sites. The farthest movement was 1.2 miles by a subadult male.

HABITAT

Land uses on the study area were characterized broadly as: agriculturally idle, grain, fallow, hay, range, or miscellaneous. By comparing availability of these types with their use by Huns, it was concluded that *agriculturally idle areas are critical* in maintaining this species in north central Montana. Idle areas include uncultivated portions of grainfields, abandoned and active farmsteads, uncultivated fencelines, and irrigation ditches. Although these areas comprised only 3% to 6% of optimum seasonal habitats of Huns (see Table 2), they were used heavily by the birds.

The size of idle areas does not seem as important to Huns (as long as it is large enough to hide them) as the undisturbed character of the area. Therefore, the greatest threat to maintaining these critical idle areas—and the Huns depending on them—is intensive farming and ranching. Intensive practices include

cultivating grainfields from border to border; removing fencelines to accommodate cultivating larger fields; grazing livestock in grainfields, irrigation ditches and field corners; applying herbicides, and burning residual cover in spring or fall. On the study area, 15% to 35% of grain stubble fields, 55% to 75% of hayfields, and 44% to 78% of the idle areas were grazed by livestock.

Grainfields are used by Huns in about the same proportion as they occur. In fact, 95% of partridge observed on the study area have been within 40 yards of grain year-round. They eat considerable quantities of grain—as green plants in late fall, winter, and spring, and as waste grain whenever available. They prefer winter wheat over spring wheat or barley, probably because it provides green leaves for a longer period each year.

But Huns occur in areas devoid of grain in Montana, such as the C.M. Russell National Wildlife Refuge, the Bob Marshall Wilderness Area, and even in Yellowstone National Park. They also inhabit areas where 90% or more of the land is devoted to growing grain. These extremes reflect the cosmopolitan nature of Huns, and probably explain why Huns are found throughout Montana.

Partridge use woody cover, like shelterbelts or windbreaks, most often in winter and least in summer. Although they like to roost in the open at night, they seek heavier cover during the day. In winter the daytime use of woody cover offers protection from predators, especially hawks. In summer, heavy or woody cover is probably used during the day because it provides coolness and shade. Partridge are not, however, closely associated with forested areas in Montana.

LAND MANAGEMENT IMPLICATIONS

The aesthetic value of partridge has long been recognized by rural landowners. Partridge can be viewed from farm and ranch house windows, and their antics can be entertaining during the winter.

More important to the landowner, Hun occurrence and density reflect land uses and management practices. If partridge disappear from an area, evaluation and modification of current uses and practices are necessary to restore the species, if that is the landowner's objective. In many areas of Montana, partridge represent "the bottom line" for upland game birds on agricultural lands. If Huns can't survive, pheasants or sharp-tailed grouse probably can't either.

Landowners do not have to lose Huns. In wet springs, when fields are difficult to cultivate, unplowed areas will no doubt yield a growth of annual forbs ("weeds"); weeds are nature's way of reclaiming disturbed soil surfaces. If the landowner can tolerate a few such areas, the plants will hold soil and its nutrients in place and result in less soil erosion—and provide cover for Huns. (Admittedly, the "weeds" also use solid nutrients and moisture.)

During dry springs, grain growers may be tempted to fully utilize all available field areas. By plowing established idle areas, field corners, and along fencelines, the soil surface is broken and the growth of weeds is actually promoted. Treating those sites with herbicides to control the weeds adds to the grower's expense. If such sites can be cultivated only two or three of every five years, it might be more economical in the long run not to plow them—and it would benefit upland game birds such as the Hun.

Agricultural advisors are increasingly viewing burning grain stubble, irrigation ditches, and borrow pits in spring or fall as something other than a necessity. Heat generated by burning may even favor germination of the seeds of some undesirable plants—which may be controlled by herbicides at additional expense—and it also removes the residual vegetational cover favored for nesting by Huns and other birds.

When possible, grazing livestock on agriculturally idle areas, irrigation ditches, and established shelterbelts should be avoided. Maintaining these areas in their stable, established character could result in less expense than repairing ditches or replacing shelterbelts. These areas also provide cover throughout the year and are especially valuable when they are near grainfields.

As the word implies, windbreaks were originally designed to minimize wind damage to soil. From November 1980 to May 1981, the U.S. Soil Conservation Service estimated that 2.5 million acres of croplands in Montana's 40 eastern counties were damaged by wind erosion; Montana led the 10 Great Plains states in such damage for the reporting period. Soil lost can never truly be "replaced" because it takes nature about 1,000 years to build one inch. If establishing new shelterbelts and maintaining old ones goes hand in hand with proper tillage practices, both farmer and Hun can benefit.

When windbreaks are designed and planted correctly around farm outbuildings, they can help insulate the structures and reduce heating bills. When planted away from buildings, the shelterbelts will attract the Huns, and the Huns will attract hunters away from human habitation—which would no doubt be welcomed by landowners.

At home in all parts of the state, the Hungarian partridge is truly deserving of the adjective, "cosmopolitan." The Hun can be found from sagebrush plains to grassy mountain foothills in Montana—and most places in between. Rural landowners have a wild friend in the Hun—and Europe's "gray partridge" is a worthy subject for hunter and photographer alike. ■

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To Make A Hunter

by John Madson
illustrated by Elliott Eaton

WHEN I was a kid, I took to school like a setter pup takes to a leash.

At summer's end, about the time squirrel season was coming in and some real action was in sight, the folks would drag me in from the woods, clean me up, and shove me into a classroom. There I'd sit, staring out the window at autumn's deepening blush and cussing my luck for not having been born an Indian a hundred years earlier—with no such thing as school.

I didn't know that boys and girls have been schooled for the past million years or more, with harsher grading systems than any I had. If I'd been an Indian kid a century before, I'd have undergone rigorous training from the time I could toddle until I'd earned my place as an adult.

A plains Indian's "kindergarten" might begin at the age of 4 or 5 with his first bow and arrow, soon followed with instruction in shooting, hunting, trailing, and plainscraft from his father, an "uncle," or older brothers. And while he learned the ways of hunting, he was also taught the spirit of the hunt. Assiniboine boys were told by their elders to "look to your equipment and use it skillfully. Study the habits of animals and birds and learn to take them at the right time and in the correct manner...." Blackfeet boys listened to lectures from eminent men who told them what they must do to be successful in life; they were instructed in religion, ethics, and heritage, as well as the practical side of hunting.

Since the dawn of humanity, the youngsters in hunting societies have been carefully schooled in ways of dealing with the world, the afterworld, and each other. Our modern laws, religion, art, literature, language, and government all grew out of this. Nearly everything I was force fed in school had its start with hunting. Knowing that at the time might have helped, although I'd have preferred starting from scratch out there in the squirrel woods.

Youngsters no longer need the deep-grained skills of hunting in order to survive. But if we want to continue to do some hunting—as millions of us do—we must remember the timeless lessons and school

• *This article appeared in the December 1981 "News for Nilo," a publication of the Conservation Department of the Winchester Group, Olin Corporation.*—Ed.

ourselves in the ways and wonders of the hunt. Some of those things are old beyond reckoning; others are brand-new. Put them together and you have modern hunter education.

Most hunter education programs today are conducted by state fish and game departments under guidelines set by the North American Association of Hunter Safety Coordinators. That title is somewhat misleading, for although the training emphasizes safety, it goes far beyond that. It may include conservation, game management, actual gun handling and shooting, survival, hunting ethics and laws, hunting techniques, care and use of equipment, and other topics—all tailored to the particular region. It touches on all hunter behavior, aiming to produce hunters who are safe, responsible, knowledgeable, and considerate of others' rights. In one form or another, modern hunting training has been around since the early 1940s when Kentucky and New Hampshire set up the first voluntary programs. Mandatory hunter training was begun by New York state in 1949, and by 1978 all states and Canadian provinces had hunter training programs. In over half of these states and provinces, persons buying their first hunting license must have passed a basic hunter education course.

There was a time when most young hunters could learn what they needed to know from someone close to them. Ideally, this was an experienced father or granddad who had the time and patience to impart his wisdom and skill and make it stick. But interest in hunting sometimes skips a generation or two, and most youngsters don't have such menfolk. Such men seem to be growing rarer, and the best place to find them today is in organized hunter training programs.

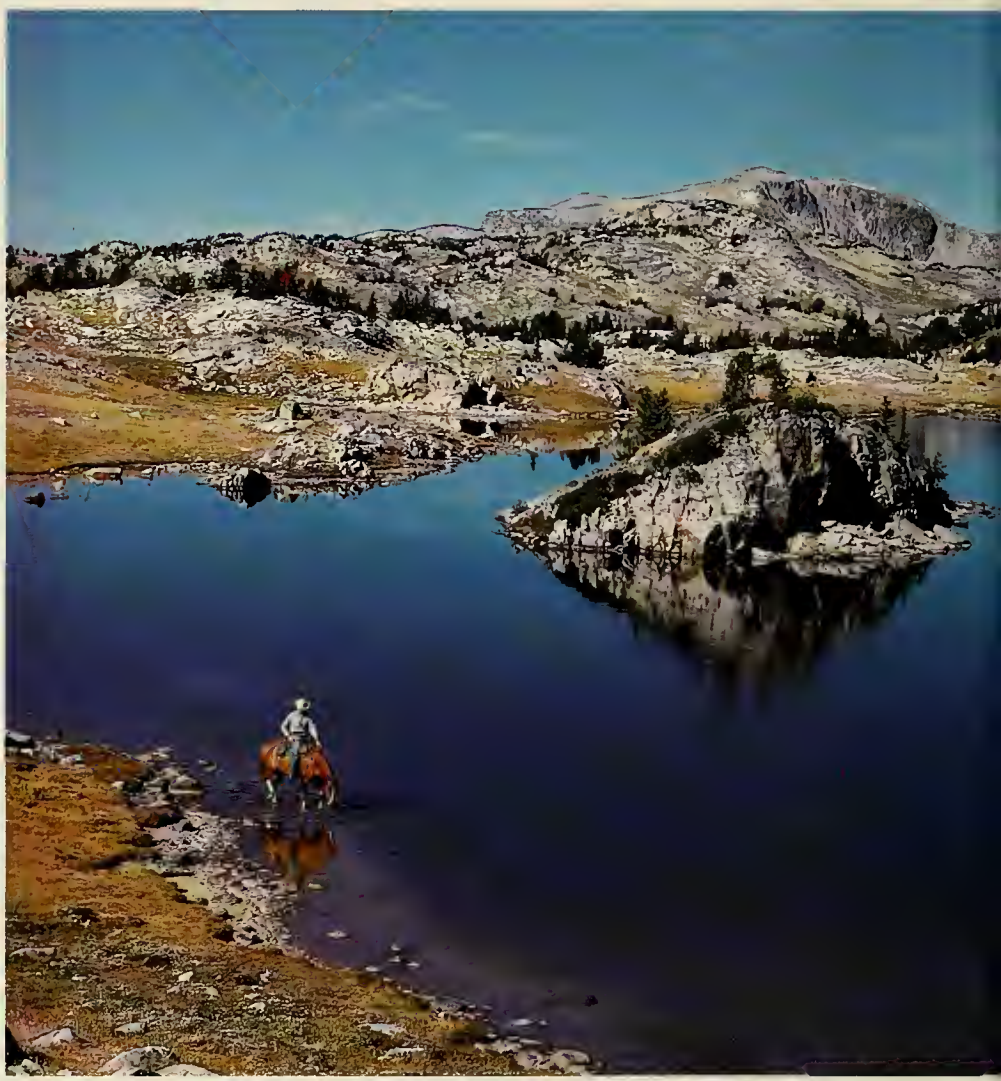
Good hunter training grows in importance as land use tightens and more hunters crowd into fewer hunting grounds. Under such conditions, quality hunting can be maintained only with quality hunters. It's been said that if we don't educate hunters, we may lose our right to hunt, and that we must improve ourselves in order to appease our enemies—which is a negative, defensive way of looking at it. We shouldn't accept responsibility in order to defend hunting, but simply in order to enjoy it more. The goal of hunter education is to enrich the life of the hunter by teaching him to understand and support the wild places that he loves, and to make safe, ethical hunting a lifelong source of satisfaction. That's the main thing—and one of its many spinoffs happens to be good public relations.

There are many tangible rewards as well, such as better access to private hunting lands, and having a head start as a trained beginner. The more you know about hunting to begin with, the more successful you're likely to be—which can keep you fired up to learn even more as you go along. There is growing interest among hunter educators to recognize and qualify certain "Master Hunters" whose deep knowledge, skill, and responsibility would serve as examples of hunters who have gone all the way.

Of all today's outdoor users—campers, fishermen, backpackers, bird-watchers, RV drivers, or whatever—only hunters are being actively taught to enter the outdoors in ethical, nondestructive ways. The emphasis is on hunters because, to the public, they appear to present the greatest threat to wildlife, property, and other people. It's ironic that the trained, ethical hunter threatens nothing, and that the untrained nonhunting public is inflicting far greater damage on our outdoors.

Someday, the hunter's responsibility may be shared by outdoor users of all sorts, with "hunter education" broadening into "outdoor education." That has been a long time coming, but hunters have blazed the trail and stand ready to lend a hand. We have much to give those who love the outdoors, whether they choose to go afield with a gun or not. We can teach them some things about living, and perhaps even about freedom. As our old friend, C.H.D. Clarke, put it: "Hunting is living. Living is an art. In our much-vaunted progress we confuse technology with the art of living. This deception clouds all aspects of life, including hunting, but the hunter, with his deep roots in the past, is freer than anyone else." ■

Scourge from the Skies



by Ken Walcheck

THE PULL of rain is strong. Last summer, I sat at the entrance to my tent and watched and listened as a black storm swept in from the west with incredible swiftness. Overhead the sky raged. Flashes of lightning darted through the trees, and thunder ripped apart the heavens. Heavy drops of rain spattered into the tent as I sat, completely fascinated. The rain's patter, the rolling thunder, the whispering breeze, seemed the most reassuring voices I had ever heard.

I stared into the belly of the storm, entranced and unconcerned. The thought of this rain carrying pollutants never crossed my mind.

Unless we are farmers or outdoors enthusiasts, most of us don't think twice about rain. Whatever falls out of the sky seems intended, even though it sometimes makes the highways slick or causes us to postpone recreation outings. We live in capsules, separated by walls and windows from nature's ancient and mysterious rhythms.

Ask the average person what he or she knows about acid rainfall in Montana or elsewhere. You'll probably receive a shrug of the shoulder and "Nothing" for an answer. Like other environmental issues, people usually do not become concerned unless the issue becomes critical to their very existence. It is difficult for many of us, such as those who live in the Big Sky Country, to believe that vast portions of this country—and others—are being mutilated by acid rain.

"Acid rain"—an odd-sounding, disquieting phrase to those of us who grew up thinking of rain as something blessed and purifying that drops gently from the heavens—is now being recognized as one of the most serious environmental dilemmas of this century, a dilemma with mind-boggling impacts. Acid rain is the popular term for precipitation that is much more acidic than normal rain or snow. Acidified precipitates (rain, snow, other forms of atmospheric moisture, and dry acidic particles) are produced when sulfur oxides or nitrogen oxides—or to a minor extent, hydrogen chloride—react with air and water in the presence of sunlight. Although the actual mechanisms that produce acid precipitation are not thoroughly understood, there seems to be little question that they result in sulfuric, nitric, and/or hydrochloric acid build-up that can render rain water as sour as vinegar.

The acidity of any liquid is measured by its pH, on a scale from 1 to 14. A pH of 7 is neutral. Numbers *less* than 7 indicate acidity; numbers *over* 7 show alkalinity. A rising pH number means increasing alkalinity, while a lower pH means higher acidity. It is important to remember that a drop of one pH unit—say, from 6 to 5—indicates a *tenfold* increase in acidity; from 6 to 4 would be a *hundredfold* jump, and from 6 to 3 a *thousandfold*. Despite what some people think, "pure" rain water is not neutral, but slightly acidic, with a pH of about 5.6. Acid rain is anything less than that.

How long have we had acidic rain? Acidification from natural causes—

Some mountainous lakes in Montana are potentially susceptible to damage by acid precipitation because of the low buffering capacity of the surrounding soils (photo: Bob Cooney).

volcanic eruptions, organic decomposition, and other sources—has always occurred, but in quantities that were modest compared with what is now being generated through man's activities. The natural acid rain cycle was accelerated with the start of the Industrial Revolution. In short order, the volume of industrial sulfur and nitrogen pollutants gained on those naturally occurring. A large coal-fired power plant today can belch out as much sulfur dioxide in a single year as was emitted by the May 18, 1980, eruption of Mount St. Helens.

Evidence suggests that coal-burning power plants and smelters contribute most to the sulfur oxides, and internal combustion engines to the nitrogen oxides. In 1980, sources in the United States spewed more than 30 million tons of sulfur dioxide into the air and nearly 25 million tons of nitrogen oxides. Canada pumped 5 million and 2 million tons, respectively, into the air. During the same year, these two nations, along with Europe, ejected nearly *100 million tons* of sulfur dioxide into the atmosphere.

Acid rain falls extensively in northern Europe, large portions of Scandinavia, the British Isles, the Atlantic Canadian Provinces, and in major portions of the eastern and midwestern United States, in California, Washington, and, to a lesser extent, in the Rocky Mountain region, including Colorado and Montana.

As reported in the Water Pollution Control Federation's *Journal* (January 1981), the acid in rain in the eastern United States has been analyzed to be about 62% sulfuric acid, 32% nitric acid, and 6% "others," including hydrochloric acid. In the western United States, the acids in rain are generally 50% nitric acid and 50% sulfuric acid, although in some areas such as California, as much as 80% of the acidity can be nitric acid.

In some parts of the country, acid rain is becoming pretty acidic—not strong enough to dissolve warts, but strong enough to leave its signature as acid-etched polka dots on auto finishes. For example, in 1978, a Pennsylvania monitoring station recorded an average rainfall pH of 3.43, an average that exceeded natural background levels by over 100 times. The lowest reading for that year was 2.32 (similar to lemon juice), or over 1,000 times the natural levels.

Even though impacts of acid rain have been well-documented in many parts of the world, the seriousness of the problem is still neither fully appreciated nor universally accepted. It is also true that much of the damage acid rain is alleged to have caused is based on minimal evidence. Let's examine some of the facts.

There's no real dispute over the fact that fish have been killed as a result of acid rain. In New York's Adirondack Mountains, at least 212 lakes are now fishless, including 180 former brook trout ponds and a number of important smallmouth bass and lake trout waters. Another 265 lakes or more are threatened because of low buffering capacity and highly acidic rainfall. To the north, in Ontario, Canada, 400 lakes have been lost and Canadian scientists estimate that at least 48,000 Canadian lakes will "die" in the next 10 to 20 years. Among the few Canadian rivers studied, nine in the Atlantic Provinces have been acidified to the point that Atlantic salmon no longer spawn there.

The first major warning that the native fish population is teetering on the brink of survival is a pervasive shift in age. The older fish survive, but their reproductive systems falter, then fail. Research has shown that high acidity can lead to improper salt and calcium levels in fish, which in turn results in altered metabolism of sodium and other elements. In some lakes with year-round acidity, the stress is chronic and debilitating. The knock-out punch comes with the spring thaw. Acids that have accumulated in the snow are released—like a sponge being squeezed—in sudden, intensive bursts, causing the already stressed fish to die in large numbers.

Some lakes resemble war-ravaged towns where only the very old and the sick are left. Although some species of fish die sooner than others, even the more resistant fishes are affected when the pH dips below 5. As the fish go, so, too, go other members of the aquatic community's complex web of life.

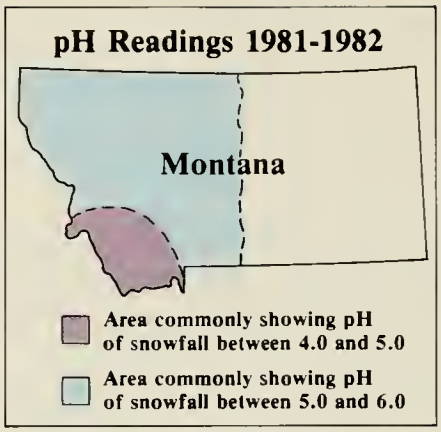
Although there is less substantial evidence than with fish mortality, acid rain and associated toxic metals produce a long list of potential threats to the environment. While effects of acid rain on the aquatic system are fairly well understood, profound ignorance exists about how it affects forests, crops, soils, wildlife, ground water, and perhaps human health.

Preliminary national assessments did not include the Rocky Mountain region (including Montana) as an area highly susceptible to acid rain fallout. Such speculations were shattered when researchers W.M. Lewis and M.C. Grant of the University of

Colorado documented substantial evidence of acidic precipitation in the Como Creek watershed in Boulder County, Colorado. Their studies, begun in June 1975, showed nearly a tenfold increase in acidity (from 5.43 to 4.63) in a three-year period. Such a finding in an area that probably would have been considered "pure" by air quality researchers generated real concern as to the source of the pollutants and potential regional effects. Because of the westerly movement of major air masses, nonidentified sources to the northwest are a strong suspect as a source of pollutants. Surprisingly, the highly polluted Denver metropolitan area was ruled out as a local source of pollution because of limited and sporadic upslope air movements.

The breath of acid rain has also reached into portions of Montana. A U.S. Soil Conservation Service (SCS) study of snowfall in western Montana during the winter of 1980-81 showed acid snow was falling in portions of western Montana (see map). Objectives of the SCS study were "to determine base pH levels for various mountain ranges across the state, and to evaluate conditions that could be created by any future major eruptions of Mount St. Helens." Southwestern Montana, especially the Big Hole and Bitterroot rivers headwaters, and portions of the upper and lower Clark Fork, Beaverhead, and Madison rivers drainages, captured the bulk of the acidic materials. Lakes and streams in many of these areas are poorly buffered, often yielding no measurable alkalinity. Twenty-nine sites registered pH values between 4 and 5 (natural pH levels for the area are around 6).

The study merely indicated acid snow was falling in Montana and did not address questions of geographic sources of the pollutants or the agents of production. The study suggests some mountainous areas of Montana are potentially susceptible to damage by acid precipitation because of the low acid buffering capacity of the surrounding soils. Dr. Gordon Pagenkopf, professor of chemistry and a researcher at Montana State University, will assist the SCS in its continuing assessment of the impacts of acid precipitation and in identifying the storm patterns that carry acid precipitation into Montana.


pH Readings 1981-1982
Montana
Area commonly showing pH of snowfall between 4.0 and 5.0
Area commonly showing pH of snowfall between 5.0 and 6.0

Dr. Jack Stanford, director of the University of Montana's Biological Station at Yellow Bay on Flathead Lake, is also concerned with the potential impacts of acid precipitation in Montana. Studies at the Yellow Bay station show that some mountain lakes in Montana are very similar to Colorado's in susceptibility to acid contamination. While most lowland soils in Montana are well-buffered, the soils in many mountainous regions are not. Monitoring stations in Glacier National Park and at the Biological Station have recorded pH values as low as 4.2.

Stanford views the acid precipitation problem in the Flathead basin as a "double-bladed threat." One of his concerns focuses on watersheds perched in geological formations with only limited buffering agents that could neutralize the incoming acidity. Acidification in such places, if widespread, could substantially alter the aquatic life. Stanford's second concern centers on a more insidious side effect of acid rain—the downstream transportation of plant growth nutrients which could lead to degradation of a lake's water quality because of overfertilizing.

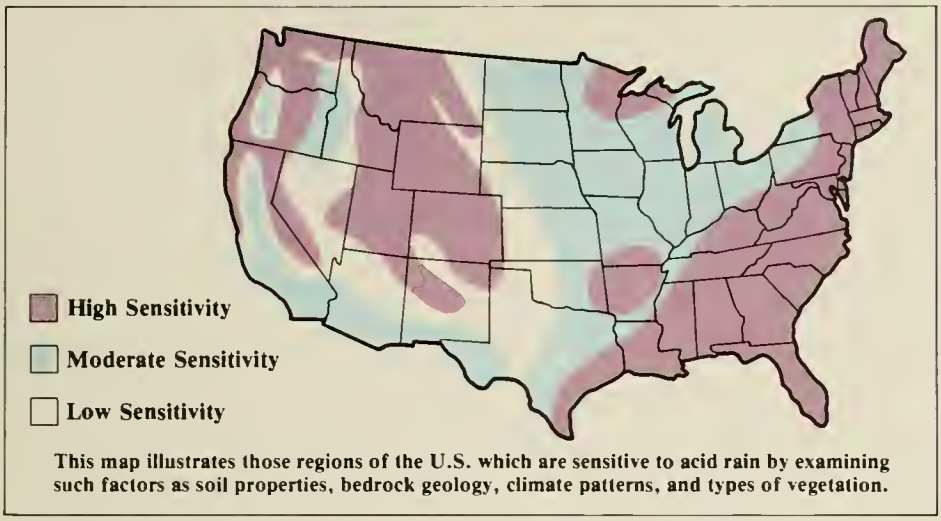
Here's how it works: Well-buffered soils subjected to acid precipitation undergo complex chemical reactions in which nitrate-rich nutrients are released from the soil to neutralize the acid in the precipitation. Such a reaction has two potential impacts. First, it reduces the amounts of nutrients available to plants for normal growth; second, it sends abnormally high concentrations of nutrients downstream which could produce a "greening effect" or accelerate algal growth. This second concern bothers Stanford. The impact of new and unnatural amounts of dissolved nutrients into nutrient-sensitive lakes such as Flathead; Glacier National Park's McDonald, Bowman, and Kintla lakes, and South Fork drainage lakes such as Sunburst, Big Salmon, and Hungry Horse Reservoir could drastically change their ecology.

The U.S. Geological Survey (USGS) has also been monitoring acid precipitation in Montana since the eruption of Mount St. Helens. Monitoring stations in the Lump Gulch area near Helena and the upper Sun River near Gibson Dam have recorded pH values "lower than one might expect," according to Roger Knapton, USGS hydrologist. At the Lump Gulch site, 19 pH values recorded in 1981 ranged between 4.3 and 4.9. At the Gibson Dam site, 16 readings dipped below 5, with a low of 4.2. Such background information underscores the importance of long-term monitoring to estabish trends of acid deposition. Unfortunately, funding for the two monitoring stations has been cut and collection of information suspended.

Even the pristine national parks in Montana have not escaped acid rain. At Yellowstone National Park, a National Atmospheric Deposition Program (NADP)* was established at the Tower Ranger Station in June 1980. From that time through 1981, the mean pH was 5.6 with values ranging between 7.3 and 4.4. "We can conclude," stated Ben Clary, assistant superintendent, "that this station receives acid precipitation. But until other studies have been done, we cannot conclude anything concerning sources of the acidity or effects on ecosystems in Yellowstone.

At Glacier National Park, monitoring programs also indicate acid rain but, like Yellowstone, the sources and effects are unknown. "Early test results," says Park Superintendent Ro-

* In 1978, the National Atmospheric Deposition Program (NADP) was initiated by the federal government with the goal of developing a long-term monitoring network throughout the United States. This year, 60 monitoring stations will be operating to determine trends in the deposition of precipitation and dry particulate matter. Montana has three NADP stations: Glacier and Yellowstone National parks, and the Bureau of Land Management site at Poplar, Mont., run in cooperation with the Fort Peck Assiniboine and Sioux tribes.



This map illustrates those regions of the U.S. which are sensitive to acid rain by examining such factors as soil properties, bedrock geology, climate patterns, and types of vegetation.

bert C. Haraden, "show readings ranging from 4.67 to 6.36." In addition to the NADP monitoring station, Glacier also has a Canadian Network for Sampling Acid Precipitation (CANSAP) station. Besides the collection of background information by NADP and CANSAP, researchers at Glacier will initiate an "effects" program this year to determine what impacts acid precipitation has on ecosystems. Concern focuses on Glacier's aquatic resources, many of which are poorly buffered. The National Park Service's Water Resources Laboratory will oversee the "effects" study which will build on information already gathered by other aquatic researchers in the area. One of the study's objectives will be development of a computer model that will predict effects of acid precipitation on the park's resources.

Limited information gathered to date in Montana indicates acid precipitation occurs in portions of western Montana, but information on distribution patterns and the sources of the acidity is nonexistent. As in other western states, we are perched on the tip of an iceberg in a state of both ignorance and vulnerability in regard to the size of the problem and its implications. For Montana, one of the more serious implications for fisheries centers on a comparison of other regional mountainous lakes similar to Montana's that have been acidified. A similar pattern, if severe enough, could lead to a loss of these lakes' ability to support the mountainous cold-water fishery for which Montana is famous. This is all the more alarming when one fully understands that there is no *natural* means presently known by which an acidified lake can be restored to its original condition as long as the inflow of acid continues, or once the natural buffering capacity of the system has been exhausted.

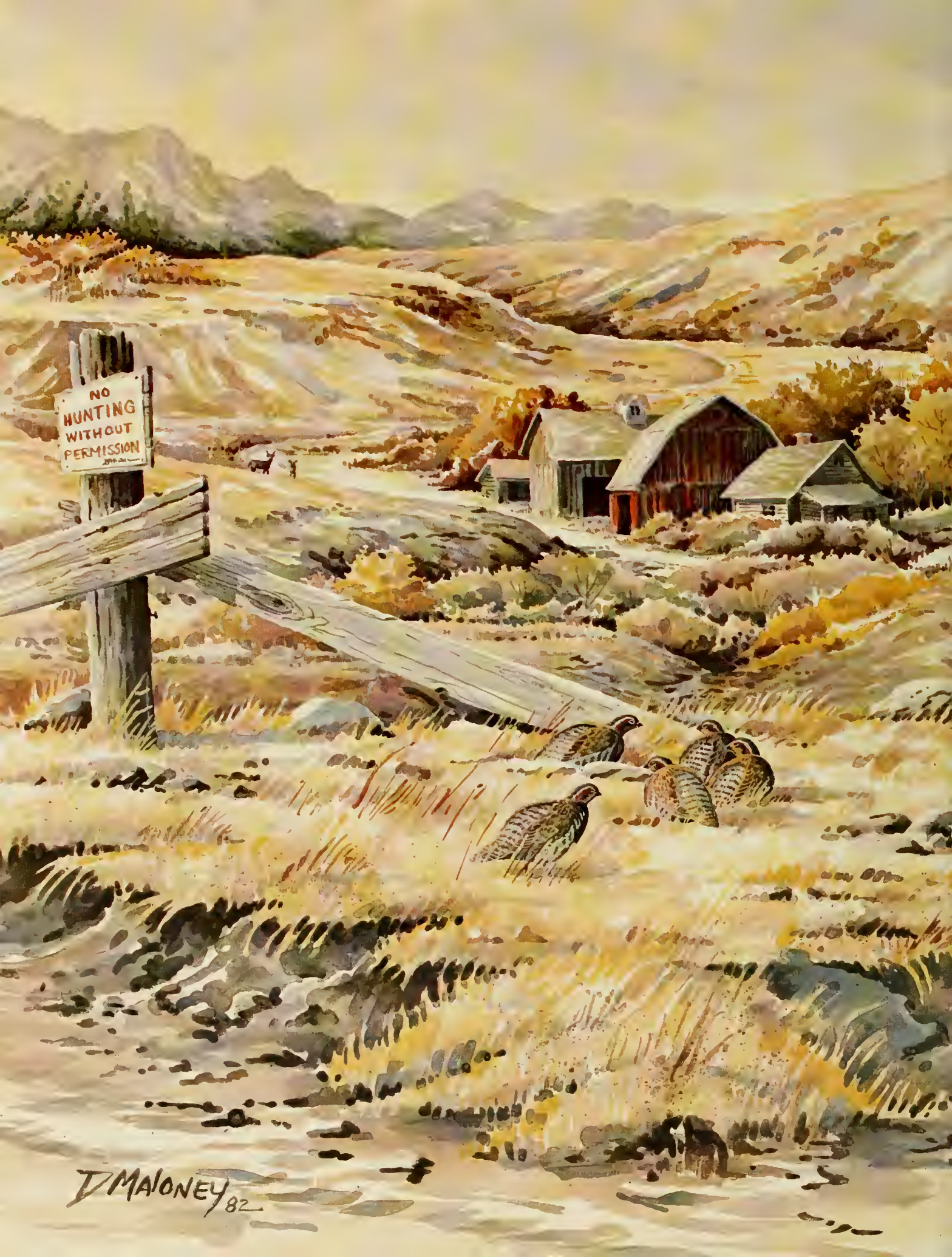
What is being done to address the acid precipitation situation in Montana? On Aug. 28, 1980, an acid rain symposium was conducted at the Yellow Bay Biological Station and a Montana action plan was adopted. Although the plan is still in the early stages, a 20-member interagency monitoring committee has been formed to coordinate the monitoring of acid deposition throughout the state. The committee, chaired by Ron Cooper, manager of the Flathead River Basin Environmental Study, will provide a complete assessment of acid precipitation in the state, both to identify and define the problem and also to evaluate its threat to sensitive areas of the ecosystem. Such an evaluation will play an important role in the state's down-the-road planning decisions on acid precipitation and the development of long-range air transport models identifying specific sources of acid precipitation, fallout patterns, and changes in air quality. This is extremely important, since areas to the west and north are beginning to turn to coal-fired electrical generating facilities to meet power needs. The liquefaction of coal is being considered, both within Montana and British Columbia, and Alberta is preparing to develop a major petrochemical industry. Historically, these areas have lacked these sorts of industrial developments and population densities which would serve as sources of acid emissions.

Coming to grips with the acid precipitation dilemma will not be easy. It will require expanded efforts to quantify its effects on the environment, to further refine cost-effective means for controlling emissions, and to impose tighter emission controls on stationary fossil fuel-burning facilities. Where the American public stands on clean air was clarified by a May 1981 Harris poll: 80% of the citizens participating opposed weakening the federal Clean Air Act, and 66% opposed relaxing pollution standards to allow power plants to burn higher sulfur content coal and oil. In another national poll, this one conducted by the National Wildlife Federation in 1982, 92% of the respondents believed Congress should require utilities to reduce sulfur emissions that form acid rain, even it it means higher electrical rates.

The key factor in determining what the future holds regarding acid rain is what Congress does with the Clean Air Act. The act is up for reauthorization in 1982, and a flurry of bills seek both to strengthen and to weaken it.

In Montana, there is a growing tradition of reaction to environmental degradation. This is well-evidenced by some of the strong environmental bills passed in the Montana Legislature to protect the state's high quality environment. But it is also clear that Montana's air quality standards are not necessarily permanent. A weakening of the federal Clean Air Act could lead to a lowering of state standards, thus opening the door to additional pollution.

If one takes the time to wade through the blizzard of information on acid rain, one quickly concludes there are no simple solutions. As with all serious environmental problems, solutions are costly and complex. In these times of economic difficulty, it is tempting to ask: Can we, as a nation, afford to do something about acid precipitation? Obviously, a majority of Americans believe the answer is yes. But perhaps the question is better stated another way: Can we, as a nation, afford *not* to do something about acid precipitation? Can we afford to lose our living lakes? ■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